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### INDIA

S. Guha.  
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DISEASES CAUSED BY BACTERIA AND FUNGI, 399-408.

*Staph. aureus* in milk: phage-typing, 399; Pathogenic and non-pathogenic staphylococci, 399; Carriage of *Staph. aureus* and wound infection, 399-400; TB. in a monkey colony, 400; Standardization of tuberculin, 400; Primary pulmonary TB. with erythema nodosum in BCG vaccination, 400; Tuberculin sensitivity in the bovine, 400-401; Official control of bovine TB., 401; Tuberculin test and bovine TB., 402; Specific cytotoxic action of tuberculin, 402; Character and nature of the tuberculin reaction, 402; Passive transfer of hypersensitiveness to tuberculin, 402-403; BCG in Denmark, 403; Influence of hormones on the tuberculin reaction, 403; Plasma viscosity in pulmonary TB., 403; Artificial infection of g. pigs with John's disease, 403-404; Biological detoxication of toxins, 404; Swine erysipelas, 404; Piglet rearing, swine erysipelas and compulsory inoculation, 404; Pectoral form of bovine pasteurellosis, 404; Microbial antagonism, 404-405; Motility and swarming of some *Enterobacteriaceae*, 405; Salmonellosis in swine. II. Swine dysentery, 405; Canine *S. typhi-murium* infection, 405; Fowl typhoid, 405-406; Strain 19 vaccine desiccated by lyophilization, 406; Skin lesions in brucellosis, 406; Brucellosis in the hare, 406; Germination of *Brucella*, 406; The collagenase of *Cl. welchii*, 406-407; Botulism in ducks, 407; Coccidioidomycosis, 407; Stachybotryotoxigenesis, a new disease of horses, 407-408; Temperature relations in phagocytosis, 408.

DISEASES CAUSED BY PROTOZOAN PARASITES, 408-409.

Bovine coccidiosis and toxoplasmosis, 408; The coccidium *Klossiella muris*, 408; Infection of *Aedes aegypti* with *P. gallinaceum*, 409; Findings P.M. in dogs with uraemia and leptospirosis, 409.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA, 409-413.

Simultaneous inoculation against foot and mouth disease with vaccine and serum, 409; Anti-rabies vaccination of dogs after being bitten, 409-410; Rabies with marked pruritus in a dog, 410; How to vaccinate, 410; Swine fever in France, 410; Plurality of dog distemper virus, 410; A virus disease of g. pigs, 410; Endemic pneumonia of the rat, transmission to mice, nature of the causal agent, 410-411; Adsorbate Newcastle disease vaccine, 411; Committee on Newcastle disease, 411; Chick embryo vaccine against Newcastle disease, 411; Oral administration of poliomyelitis virus to African green monkeys, 411; Alterations in susceptibility of the mouse to poliomyelitis by oestrogenic substances, 411; Poliomyelitis virus in sewage, 411-412; Poliomyelitis virus levels in nervous tissue, 412; Poliomyelitis virus from the throats of symptomless children, 412; A skin reaction provoked by killed tubercle bacilli in human lymphogranuloma, 412-413; Direct culture of rheumatic virus, 413; "Inclusion bodies" of typhus fever, 413.

IMMUNITY, 413-414.

Antibodies, 413; Immunization against fowl cholera, 413; Immunological relationships among polysaccharides from various organisms, 413-414; Lymph and the lymphatic system in antiviral immunity, 414; Specific sensitivity in lower animals, 414.

PARASITES IN RELATION TO DISEASE [ARTHROPODS], 414-416.

The fleas of Alberta, vectors of sylvatic plague. II. The epizootic plague in ground squirrels in Alberta, 414-415; Insect tests of wire screening effectiveness, 415; Bionomics of *Psorergates ovis* of sheep and its control, 415-416; Canine demodectic mange, 416.

PARASITES IN RELATION TO DISEASE [HELMINTHS], 416-419.

Bovine cysticerci in the masticatory muscles, tongue, musculature and heart, 416; Helminths infective to man in the hamster, 416; Casoni reaction and Michailow's test in hydatid disease, 416-417; Hydatid disease in Victoria, 417; Urobilin in echinococcosis of the bovine liver, 417; Investigation of the eggs of horse strongyles, 417; Parasitic aneurysm in the horse, 417; Nematodes of domestic ruminants in the Punjab and United Provinces, morphology of *Trichuris globulosa*, 417-418; New species of *Trichuris* from domestic ruminants, 418; Trichinosis in rats in Toronto, 418; Second ecdysis of *Trichostrongylus retortaeformis*, 418; Tumour formation in skin lesions caused by *Habronema* larvae, 418; "Summer bleeding" in horses caused by *Parafilaria multipapillosa*, 418; Effect of an all plant ration on the resistance of an omnivorous animal to parasitism, 418; Helminthiasis in domestic animals, 418-419.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS], 419-421.

Renal tumours in the bovine, 419; Primary melanoma of the palate of a dog, 419; Attempted transmission of leukaemia from man to man by the sternal marrow route, 419; The biological basis of malignant growths, 419; Heredity in tumour development, 419; Production of sarcoma with wheat germ oil, 419; Induction of neoplasia in rabbit skin grown in tissue culture and treated with Shope papilloma virus, 419; Sarcoma in rats from injection of ground *Taenia* larvae, 419-420; Succinoxidase activity of livers from rats during development of hepatic tumours, 420; Effect of progesterone on the development of mammary cancer in mice, 420; Radiation-induced lymphoid tumours of mice, 420; Transplantation of an adrenal cortical carcinoma, 420; Genetic relationship between mortality from induced and spontaneous lymphomatosis, 420-421; Effects of natural immune bodies from chickens and ducks on variants of a sarcoma virus, 421; New duck variants of the Rous sarcoma. II. Transmission to pigeons of variants of Rous sarcoma, 421.

DISEASES [NON-INFECTIVE] OF BREEDING STOCK, 421-423.

Artificial insemination in the mare, 421-422; Action of serum gonadotropin, ovarian response after hypophysectomy, 422; Interstitial cell stimulation and luteinization under the influence of male and female hypophyses, 422; Placental hormones after death of foetus with viable placenta, 422; Reproductive hormones in veterinary practice, 422; Sex hormones and egg production, 422-423; Seminal fluid acid phosphatase in sterility, 423; Endemic sterility in cattle, 423; Morphology of the feet in polydactyl cats, 423.



## DISEASES, GENERAL, 423-426.

Medical geography, 423-424; Allergic dermatitis in the horse, 424; Periodic ophthalmia, 424; Epistaxis in cattle, 424; Gonitis in foals, 424; Feeder lamb loss in New York, 424-425; Fatal syncope in pigs, 425; Fatal syncope of swine a thyrotoxicosis, 425; Electrocardiogram in fatal syncope in swine, 425; Sclerotic splenomegaly and liver cirrhosis in the pig, 425; Xanthomatosis of the arterial media in a dog, 425-426; Lipoid pneumonia, 426; Diarrhoea and enteritis, 426; Observations in fibrinolysis, 426.

## NUTRITIONAL AND METABOLIC DISORDERS, 426-430.

Nutritive value of skim milk, 426-427; Australian natural waters for livestock, 427; Deficiency symptoms in cows on Alpine pastures, 427; Mineral requirements of stock in New South Wales, 427-428; Effects of arsenic and manganese on copper in the synthesis of hemoglobin, 428; Alloxan diabetes in the sheep, 428; Wheat gluten and canine hysteria, 428-429; Anaemia produced in dogs by oestradiol benzoate, 429; Oedema and ascites in poults, 429-430.

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY, 430-432.

Hypophyses of wild and domestic animals, 430; Critical temperatures for domestic animals, 430; Reaction of the pig, cat, dog and sheep to hot atmospheres, 430-431; Induction and maintenance of lactation, 431; Colostrum in the cow, 431; Lipoid-protein system of the blood serum, 431; Plasma bilirubin in the horse, 431; Uneven wear of the teeth of horses, 431; Cyclic change in the histochemistry of the kidney in oestrus cycle in the rat, 431; Periodicity of oestrus and non-breeding seasons in Australia, 431-432; Neuro-secretion, 432; Puncture of the spinal cord in swine, 432.

## POISONS AND POISONING, 432-433.

Arsenical poisoning in horses, 432-433; Pathological changes by lewisite and allied compounds, 433.

## PHARMACOLOGY AND THERAPEUTICS, 433-438.

Evolution of new drugs. Depressants, hypnotics, narcotics, and anaesthetics, 433; Sulpha-combination—a new chemotherapeutic principle, 433; Sulphathalidine therapy of intestinal disease in calves and swine, 433; Blood picture in sulphonamide administration, 433; Passage of sulphathiazole through the blood-liquor barrier, 434; Use of mice in examination of drugs for chemotherapeutic activity against TB., 434; Penicillin in veterinary medicine, 434; Distribution of penicillin in the eye after subconjunctival injection, 434; Conjoined action of penicillin and bacteriophages, 434; Effect of penicillin on human type *M. tuberculosis*, 435; Effect of penicillin on the tubercle bacillus, 435; Paludrine in malaria, 435; Chemoprophylaxis of influenza infections in eggs, 435; Antibiotics and canine distemper, 435; Phenothiazine in parasitic diseases in animals, 436; Treatment of fascioliasis in cattle with hexachlor-ethane, 436; Enzymatic anthelmintics, 436; Uterine torsion in cows, 436; Basis of follicular hormone medication, in ovarian insufficiency, 436; Action of relaxin in the mouse, 436; Antibiotics, vitamin analogues and other compounds in gas gangrene, 437; Method of testing sensitivity of

bacteria to penicillin and sulphathiazole by paper discs, 437; CTAB in the control of *Str. agalactiae* mastitis, 437; Sterilization of bacteria by mercuric compounds, 438; Organic mercurial preparations in diseases of the skin, 438; Surface-active agents, 438.

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION, 438-440.

Thermophilic organisms, 438; Precoliform studies of pasteurized milk, 438; Surface-active cationic germicides and bacterial population of milk, 439; Asmara milk centre, 439; Mastitis and the plate count of milk. VI, 439; Bacteriological investigation of slaughter stock, 439; Game animal inspection, 440; Food poisoning, 440; Uruguay: import and export of animals, 440.

## ZOOTECNY, 441.

The transport of animals by sea between South Africa and India during World War II; the effect of alkalinity or arsenical acaricidal dips; notes on the hides and skins industry; relation of the weight of the skin to the live weight of cattle of the Niederung breed; the problem of castration in nutria breeding.

## TECHNIQUE AND APPARATUS, 442-444.

Clorox digestion for finding acid-fast organisms in sputum, 442; Fluorescence microscopy, 442; Centrifuged agglutination reactions, 442; Production of hydrogen peroxide by the pneumococcus and a test for peroxide, 442; Simple method for Wassermann test on anticomplementary serum, 443; Fluorescent staining of living and dead bacteria, 443; Agar technique for arresting movement in protozoa, 443; Blood sedimentation rate in cattle, 444; Haemoglobin determination by the copper sulphate-blood gravity method, 444; Microtechnique of the pathologic eye, 444; Demonstration of heart sounds of horses by an ordinary wireless set, 444; Detection of organ-specific enzymes for clinical diagnosis, 444.

## MISCELLANEOUS, 445.

Soil and milk production; veterinary medicine in Spain; veterinary affairs in Costa Rica; horses shying at automobiles.

## REPORTS, 446-451.

Canada: Reports of the Minister of Agriculture for the years 1941-45, 446; Canada: Report of the Ontario Veterinary College, 1945, 449; U.S.A.: Rockefeller Foundation, International Health Division, annual report for 1945, 451; U.S.A.: Report of the Veterinary College at Cornell University for 1944-45, 451.

## BOOK REVIEWS, 453-454.

Diagnostic methods in veterinary medicine [BODDIE], 453; Functional anatomy of the mammal. A guide to the dissection of the cat and an introduction to the structural and function relationship between the cat and man [LEACH], 453; Clean milk a source of health [GOJON], 453; The chemistry of anaesthesia [ADRIANI], 454; Researches on pre-natal life. Vol. I [BARCROFT], 454; Essentials of histology [HOSKINS & BEVELANDER], 454.



## INDEX TO AUTHORS

- ANON., 410, 411, 428 & 434.
- Aaser, C. S., 445.
- Acevedo, R. A., & Mendoza, I. L., 411.
- Ackert, J. E., Branson, D. S., & Ameel, D. J., 418.
- Adriani, J., 454.
- Ameel, D. J. See Ackert, J. E., et al., jt. authors, 418.
- Andersen, A. H., & Simesen, M. H., 434.
- Anderson, E. O. See Seeley, H. W., Jr., et al., jt. authors, 439.
- Andrews, G. W. S., 434.
- Arkhipov, V. V. See Chebotarev, R. S., et al., jt. authors, 436.
- Asenjo, C. F., 436.
- Axelsson, J., & Kivimäe, A., 430.
- Aycock, W. L. See Foley, G. E., jt. author, 411.
- Bailly, J., 410.
- See also Remlinger, P., jt. author, 409.
- Baker, D. W. See Whitlock, J. H., jt. author, 424.
- Ballentine, R. See Ryan, F. J., et al., jt. authors, 437.
- Barcroft, J., 454.
- Baumann, R., 418.
- Beeuwkes, H., 410.
- Behrendt, R. See Herre, W., jt. author, 430.
- Bekker, J. H. See Verlinde, J. D., jt. author, 403.
- Bevelander, G. See Hoskins, M. M., jt. author, 454.
- Biggs, R., Macfarlane, R. G., & Pilling, J., 426.
- Bingham, M. L. See Ottaway, C. W., jt. author, 417.
- Blevins, A. See MacNeal, W. J., et al., jt. authors, 434.
- See also Neal, W. J. M., et al., jt. authors, 413.
- Block, S. S., 415.
- Bloom, F., 425.
- Boddie, G. F., 453.
- Bodian, D., & Cumberland, M. C., 412.
- See also Howe, H. A., jt. author, 411, 412.
- Bøe, J., 399.
- Bouvier, G. See Roux, L., jt. author, 406.
- Branson, D. S. See Ackert, J. E., et al., jt. authors, 418.
- Brewer, N. R. See Heisdorf, A. J., et al., jt. authors, 420.
- Brown, J. H., 414, *bis*.
- Buchbinder, L., & Fertig, J. W., 438.
- Bucher, H., 443.
- Bullough, W. S., 443.
- Burrows, H., & Hoch-Ligeti, C., 420.
- Byrne, E. A. J., 438.
- Cameron, G. M., & Castles, R., 442.
- Cameron, G. R., Carleton, H. M., & Short, R. H. D., 433.
- Campbell, J. G., 453.
- Cámpori, A. S., Harispe, C., Eckell, O. A., Orliacq, C., & González, B., 424.
- Canada. Rep. Minist. Agric., 1941-45, 446.
- Rep. Ontario vet. Coll., 1945, 449.
- Cardosa, H. T. See Lacorte, J. G., et al., jt. authors, 442.
- Carleton, H. M. See Cameron, G. R., et al., jt. authors, 433.
- Castles, R. See Cameron, G. M., jt. author, 442.
- de Cavalho Pereira, P. See Lamounier, R. D., jt. author, 444.
- Ceccarelli, A., 417.
- Chebotarev, R. S., Arkhipov, V. V., & Koloskova, V. R., 436.
- Clark, P. F. See Harmon, D. R., et al., jt. authors, 408.
- Clayton-Cooper, B. See Miles, A. A., et al., jt. authors, 399.
- Cole, G., 417.
- Coman, D. R., 419.
- Coronel, A. B., 411.
- Corper, H. J., & Stoner, R. E., 402.
- Corson, M. E. See Ryan, F. J., et al., jt. authors, 437.
- Costa Rica. Survey vet. affairs, 445.
- Crofton, H. D., 418.
- Cruz, W. O., de Mello, R. P., & Da Silva, E. M., 429.
- Cumberland, M. C. See Bodian, D., jt. author, 412.
- Curtis, M. R. See Dunning, W. F., jt. author, 419.
- Dadot, F., 407.
- Danforth, C. H., 423.
- Darraspen, E. See Tapernoux, A., et al., jt. authors, 432.
- Delage, B., 431.
- Delory, G. E., 423.
- Dibblee, D. D. See DuBois, A. S., jt. author, 439.
- Doyle, H. S., 440.
- Drobocki, V. G., 407.
- DuBois, A. S., & Dibblee, D. D., 439.
- Dunning, W. F., & Curtis, M. R., 419.
- Duran-Reynals, F., 421, *bis*.
- & King, J. W., 421.
- Eckell, O. A. See Cámpori, A. S., et al., jt. authors, 424.
- Edillo, B., 403.
- Edwards, S. J. See Hughes, D. L., jt. author, 437.
- Eugster, J., 423.
- Fairley, N. H., et al., 435.
- Falk, J. E., 433.
- Feldman, H. A., 442.
- Feldman, W. H. See Heilman, D. H., jt. author, 402.
- Fertig, J. W. See Buchbinder, L., jt. author, 438.
- Filak, L. See MacNeal, W. J., et al., jt. authors, 434.
- Fink, K. See Trautmann, A., jt. author, 441.
- Fischer, E. K., 438.
- Flückiger, G., 401, 402.
- Foley, G. E., & Aycock, W. L., 411.
- Francis, J., 402.
- French, M. H., 441.
- Frisk, A. R., Hagerman, G., Helander, S., & Sjögren, B., 433.
- Fritzsche, K., & Rösler, M., 404.
- Gaidamovich, S. Y., & Soloviev, V. D., 414.
- Gard, S., 408.
- Gardiner, J. G., 446, *quingu*.
- Giroud, P., 413.
- Gonnet, S. See Tapernoux, A., et al., jt. authors, 432.
- González, B. See Cámpori, A. S., et al., jt. authors, 424.
- Gorrie, C. J. R., 405.
- Goujon, A., 453.
- Graham, N. P. H., 415.
- Grashuis, J., & de Man, T. J., 422.
- Green, H. H., Rasmussen, A. F., Jr., & Smadel, J. E., 435.
- Grinblat, S., 416.
- Gunn, R. M. C., 422.
- Grüttner, F., 441.
- Habel, K., 400.
- Hagerman, G. See Frisk, A. R., et al., jt. authors, 433.
- Hagmayer, 404.
- Hall, K., & Newton, W. H., 436.
- Harispe, C. See Cámpori, A. S., et al., jt. authors, 424.
- Harkness, J. See Houston, J., et al., jt. authors, 403.
- Harmon, D. R., Zarafonetis, C., & Clark, P. F., 408.
- Harris, P. N., 419.
- Hauduroy, P., & Posternak, J., 442.
- Haurowitz, F., 413.
- Hayes, W. See Shirlaw, J. F., et al., jt. authors, 405.
- Hayston, J. T., 405.
- Heilman, D. H., & Feldman, W. H., 402.
- Heisdorf, A. J., Brewer, N. R., & Lamoreux, W. F., 420.
- Helander, S. See Frisk, A. R., et al., jt. authors, 433.
- Hepding, L., 425.
- Herre, W., & Behrendt, R., 430.
- Heston, W. E., 419.
- Heyningen, W. E. See Oakley, C. L., et al., jt. authors, 406.
- Hoch-Ligeti, C., 420.
- See also Burrows, H., jt. author, 420.
- Hoekstra, J., 409.
- Holm, J., 403.
- & Lind, P., 400.
- Holman, H. H., 453.
- Hoskins, M. M., & Bevelander, G., 454.
- Houdinière, A., 431.
- Houston, J., Harkness, J., & Whittington, R. B., 403.
- Hovanitz, W., 408.
- Howard, I. See Stuart, C. A., et al., jt. authors, 405.
- Howe, H. A., & Bodian, D., 411, 412.
- Hughes, D. L., & Edwards, S. J., 437.
- Hummelincq, P. W., 417.
- Hutchinson, R. C., 426.
- Hynes, M., & Lehmann, H., 444.
- Iland, C. N., 435.
- Imig, H., 425.
- Jarrett, I. G., 428.
- Kaplan, H. S., 420.
- Karras, 444.
- Kelley, R. B., & Shaw, H. E. B., 431.
- Kerr, W. R., Lamont, H. G., & McGirr, J. L., 400.
- King, J. W. See Duran-Reynals, F., jt. author, 421.
- Kivimäe, A. See Axelsson, J., jt. author, 430.
- Koloskova, V. R. See Chebotarev, R. S., et al., jt. authors, 436.
- Krupski, A., 427.
- Krzywanek, F. W., & Ruud, G., 425.
- Kuitunen-Ekbaum, E., & Webster, D., 418.
- Lacorte, J. G., Cardosa, H. T., & Santos, M., 442.
- & Santos, M., 442.
- Lamont, H. G. See Kerr, W. R., et al., jt. authors, 400.
- Lamoreux, W. F. See Heisdorf, A. J., et al., jt. authors, 420.
- Lamounier, R. D., & de Carvalho Pereira, P., 444.
- Lathrop, G. E., 444.
- Lauprecht, E., 445.
- Leach, W. J., 453.
- Lee, D. H. K., & Robinson, K., 430.
- See also Robinson, K., jt. author, 430, *ter*.
- Lehmann, H. See Hynes, M., jt. author, 444.
- Leue, P., 431.
- Leuthold, A., 424.
- Levowitz, D., 438.
- Lind, P. See Holm, J., jt. author, 400.
- Lito, E. See de Loureiro, J. A., jt. author, 438.
- Little, C. C. See Woolley, G. W., jt. author, 420.
- Löfgren, S., 400.
- de Loureiro, J. A., & Lito, E., 438.
- Loveday, R. K., 441.
- McClymont, G. L., 427.
- Macdonald, A., 399.
- McDonald, S. See Shirlaw, J. F., et al., jt. authors, 405.
- Macfarlane, R. G. See Biggs, R., et al., jt. authors, 426.
- McGann, V. See Stuart, C. A., et al., jt. authors, 405.
- McGirr, J. L. See Kerr, W. R., et al., jt. authors, 400.
- McHargue, J. S. See Skinner, J. T., jt. author, 428.
- MacNabb, A. L., 449.
- MacNeal, W. J., Filak, L., & Blevins, A., 434.
- Madelenat, P., 431.
- de Man, T. J. See Grashuis, J., jt. author, 422.
- Markwardt, 416.
- Marot & Pierron, 408.
- Martin, A. R., 434.
- de Mello, R. P. See Cruz, W. O., et al., jt. authors, 429.



- Melnick, J. L., 411.  
 Mendoza, I. L. See Acevedo, R. A., jt. author, 411.  
 Michelsen, E., 410.  
 Miles, A. A., Williams, R. E. O., & Clayton-Cooper, B., 399.  
 Möhlmann, H., 409.  
 Montgomery, S. A., 435.  
 Morley, D. C., 437.  
 Muggleton, P. See Ungar, J., jt. author, 435.  
 Neal, W. J. M., Wardell, K., Blevins, A., & Pacis, M. R., 413.  
 Nelson, J. B., 410.  
 Neves e Castro, A. V., 421.  
 Newton, W. H. See Hall, K., jt. author, 436.  
 Nowitzki, E., 444.  
 Oakley, C. L., Warrack, G. H., & van Heyningen, W. E., 406.  
 van Oijen, C. F., 439.  
 Oliver-Gonzalez, J., 413.  
 Olt, 440.  
 Orliacq, C. See Cămpori, A. S., et al., jt. authors, 424.  
 Ortega, J. A. See Rosenthal, W., jt. author, 441.  
 Oster, K. A., 431.  
 Ottaway, C. W., & Bingham, M. L., 417.  
 Pacis, M. R. See Neal, W. J. M., et al., jt. authors, 413.  
 Petherick, M. H., & Singer, E., 404.  
 Pfeiffer, C. A., 422.  
 Pierron. See Marotel, jt. author, 408.  
 Pilling, J. See Biggs, R., et al., jt. authors, 426.  
 Pires, R. E., 419, *bis*.  
 Plastring, W. N. See Seeley, H. W., Jr., et al., jt. authors, 439.  
 Polding, J. B., 406.  
 Posternak, J. See Hauduroy, P., jt. author, 442.  
 Potemkina, V. A., 436.  
 Pugh, L. P., 428.  
 Ramon, G., Richou, R., & Ramon, P., 404.  
 Ramon, P. See Ramon, G., et al., jt. authors, 404.  
 Ramsay, W. N. M., 431.  
 Rao, S. B. V., 404.  
 Rasmussen, A. F., Jr. See Green, H. H., et al., jt. authors, 435.  
 Reddin, L., Jr., & Stever, D. W., 424.  
 Remlinger, P., & Bailly, J., 409.  
 Rewell, R. E., 426.  
 Richou, R. See Ramon, G., et al., jt. authors, 404.  
 Ritchie, J. N., 453.  
 Robak, H., 419.  
 Robinson, K., & Lee, D. H. K., 430, *ter*.  
 —. See also Lee, D. H. K., jt. author, 430.  
 Rodriguez Loustau, J. A., 413.  
 Rösler, M. See Fritzsche, K., jt. author, 404.  
 Rosenthal, S. R., & Routien, J. B., 407.  
 Rosenthal, W., & Ortega, J. A., 441.  
 Routien, J. B. See Rosenthal, S. R., jt. author, 407.  
 Roux, L., & Bouvier, G., 406.  
 Rudau, 425.  
 Ruud, G. See Krzywaneck, F. W., jt. author, 425.  
 Ryan, E. J. See Ryan, F. J., et al., jt. authors, 437.  
 Ryan, F. J., Ballentine, R., Schneider, L. K., Stolovy, E., Corson, M. E., & Ryan, E. J., 437.  
 Salomon, L. See Thiéry, J. P., jt. author, 410.  
 San Egaña, C., 445.  
 Sandstedt, H., 433.  
 Santos, M. See Lacorte, J. G., jt. author, 442.  
 —. See also Lacorte, J. G., et al., jt. authors, 442.  
 Sarwar, M. M., 417, 418.  
 Scharer, B. See Scharer, E., jt. author, 432.  
 Scharer, E., & Scharer, B., 432.  
 Scheidy, S. F. See Verwey, W. F., jt. author, 406.  
 Schneider, L. K. See Ryan, F. J., et al., jt. authors, 437.  
 Schoch, A., 406.  
 Schornagel, H., 426.  
 Schroeder, C. R., 414.  
 Scrivner, L. H., 429.  
 Seeley, H. W., Jr., Anderson, E. O., & Plastring, W. N., 439.  
 Sforza, M., 439.  
 Shaw, H. E. B. See Kelley, R. B., jt. author, 431.  
 Shirlaw, J. F., McDonald, S., & Hayes, W., 405.  
 Short, R. H. D. See Cameron, G. R., et al., jt. authors, 433.  
 da Silva, E. M. See Cruz, W. O., et al., jt. authors, 429.  
 Silva Leitão, J. L., 418.  
 Simesen, M. H. See Andersen, A. H., jt. author, 434.  
 Singer, E. See Petherick, M. H., jt. author, 404.  
 Sjögren, B. See Frisk, A. R., et al., jt. authors, 433.  
 Skinner, J. T., & McHargue, J. S., 428.  
 Smadel, J. E. See Green, H. H., et al., jt. authors, 435.  
 Soloviev, V. D. See Gaidamovich, S. Y., jt. author, 414.  
 Spafford, W. J., 427.  
 Spörri, H., 436.  
 Stever, D. W. See Reddin, L., Jr., jt. author, 424.  
 Stolovy, E. See Ryan, F. J., et al., jt. authors, 437.  
 Stolz, A., 433.  
 Stoner, R. E. See Corper, H. J., jt. author, 402.  
 Stuart, C. A., Wheeler, K. M., McGann, V., & Howard, I., 405.  
 Tapernoux, A., Darraspen, E., & Gonnet, 432.  
 Taran, A., 443.  
 Teunissen, G. H. B., 423.  
 Thiersch, J. B., 419.  
 Thiéry, J. P., & Salomon, L., 410.  
 Trautmann, A., & Fink, K., 441.  
 Ungar, J., & Muddleton, P., 435.  
 U.S.A. Ann Rep. internat. Hlth Div., Rockefeller Foundation, 451.  
 Unsworth, K., 416.  
 Uruguay. Import and export of animals decree, 440.  
 Velu, H., & Zottner, G., 418.  
 Verlinde, J. D., & Bekker, J. H., 403.  
 Verwey, W. F., & Scheidy, S. F., 406.  
 Wardell, K. See Neal, W. J. M., et al., jt. authors, 413.  
 Warfvinge, L. E., 412.  
 Warrack, G. H. See Oakley, C. L., et al., jt. authors, 406.  
 Watson, J. M., 416.  
 Weber, W., 432.  
 Webster, D. See Kuitunen-Ekbaum, E. jt. author, 418.  
 Weipers, W. L., 428.  
 Wheeler, K. M. See Stuart, C. A., et al., jt. authors, 405.  
 Whitlock, J. H., & Baker, D. W., 424.  
 Whittington, R. B. See Houston, J., et al., jt. authors, 403.  
 Williams, P. C., 422.  
 Williams, R. E. O. See Miles, A. A., et al., jt. authors, 399.  
 Wilson, J. E., 405.  
 Woolley, G. W., & Little, C. C., 420.  
 Wyssmann, E., 424.  
 Zafarontis, C. See Harmon, D. R., et al., jt. authors, 408.  
 Zollinger, F., 436.  
 Zondek, B., 422.  
 Zottner, G. See Velu, H., jt. author, 418.

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## DISEASES CAUSED BY BACTERIA AND FUNGI

MACDONALD, A. (1946.) **Staphylococcus aureus in cows' milk: the results of phage-typing.**—*Mon. Bull. Min. Hlth Emerg. publ. Hlth Lab. Serv.* 5. 230-233. [Author's summary copied verbatim.] 1694

*Staph. aureus* has been isolated from more than half of the 280 samples of accredited milk examined in Norfolk. It was not possible, by ordinary tests, to distinguish the milk strains of *Staph. aureus* from those isolated from human sources.

By phage-typing it has been shown that the great majority of milk strains and those isolated from clinical cases of bovine mastitis belong to one provisional phage type, Type 42 D.

*Staph. aureus* of the same bacteriophage type was isolated in a small number of cases from the hands of milkers.

The fact that bovine strains of *Staph. aureus* belong to one phage type may afford a useful clue to the source of certain human staphylococcal infections.

BØE, J. (1944.) **On the distinction between pathogenic and non-pathogenic staphylococci.**—*Acta path. microbiol. scand.* 21. 721-730. [In English: author's summary copied verbatim.] 1695

There seems to be no sharp limitation between pathogenic and apathogenic staphylococci. And as these organisms are often found on the healthy organism and in the air, it is often difficult to be certain as to whether an isolated staphylococcus has been of pathogenic significance in the pathological process from which it is isolated.

Opinion is divided as to the value of the biochemical reactions in general use for determining the pathogenicity of staphylococci. Individually none of them is reliable.

The object of the present investigation was to evaluate these biochemical reactions in the determination of the pathogenicity of staphylococci. The results were then compared with serological tests, with animal experiments and

with the pathological processes and the localizations from which the strains were isolated.

509 strains were isolated from various staphylococcus infections in humans, from normal skin and mucous membrane and from air.

No staphylococci with particular characteristics for any pathological processes or localizations could be found.

Plasma coagulation was found to be the most reliable sign of pathogenicity, and next after this mannite fermentation. Pigment formation and hemolysin production were very unreliable properties. The crystal violet reaction was also unreliable, and cultivation on brome thymol blue agar did not seem to afford any advantages, either with respect to the primary isolation or the determination of pathogenicity.

Animal experiments afford no reliable basis for distinguishing between pathogenic and apathogenic staphylococci, as many definitely pathogenic strains are only slightly virulent for animals. On subcutaneous and intracutaneous injection, the reactive capacity of the animal seems to be just as significant as the pathogenicity of the strains. By precipitation experiments the strains could be classified into a group A which included the pathogenic strains and a group B which included the apathogenic strains. In a few cases there was disagreement between the biochemical reactions and the serological properties of the strains.

Agglutination and agglutinin-absorption showed that there were all transitional forms between the antigen structure of the strains, but the difficulties involved in obtaining a stabile antigen make the results of these experiments unreliable. Antiformin treatment of the antigen seems to be no better than heat-killed or formalin-killed antigen.

MILES, A. A., WILLIAMS, R. E. O., & CLAYTON-COOPER, B. (1944.) **The carriage of *Staphylococcus (pyogenes) aureus* in man and its relation to wound infection.**—*J. Path. Bact.* 56. 513-524. 1696

Examination for *Staph. aureus* infection, by



swabbing from the anterior nares and wrist, was carried out on over 1,000 normal human beings. 40-50% of them carried staphylococcal infections in the nares and 10-20% carried infections on the skin of the back of the wrist.

There was a significant correlation between skin carriers and nasal carriers. In 16 cases with infections in both sites the bacteriophage types of the strains isolated were determined. In 15 of these cases, the type from the nose was the same as that from the wrist. In one of them it was different.

The authors also show that there is a tendency for persons to be persistent carriers of *Staphylococcus aureus*, or to be persistently free from infection. In a series of weekly swabbings, from the nares, it was shown that in 75% of patients examined the result of examination of the swab was the same as it had been two weeks earlier.

The population in a hospital tends to have a higher carrier rate than the general population.

—ANGUS FOGGIE.

HABEL, K. (1947.) **Tuberculosis in a laboratory monkey colony. Its spread and its control.**—*Amer. Rev. Tuberc.* 55. 77-92. [Spanish summary: English summary slightly amended.] 1697

Tuberculosis is the chief cause of naturally occurring deaths in the monkey colony of *Macacus mulatta* at the National Institute of Health, Bethesda, Maryland, U.S.A.

The incidence of tuberculosis and its spread in a monkey colony depend on the degree of contact, length of contact and density of infected animals. Spread is probably through the respiratory tract.

In *Macacus mulatta* monkeys tuberculosis is a fatal disease and there is no evidence of immunity. The spread of the disease in the colony can be controlled by repeated tuberculin testing with removal of reactors. A high degree of correlation between tuberculin test and autopsy evidence of tuberculosis is demonstrated. The majority of monkeys die of tuberculosis within six months of their becoming tuberculin-positive.

HOLM, J., & LIND, P. (1947.) **Standardization of tuberculin.**—*Publ. Hlth Rep., Wash.* 62. 188-201. 1698

This article presents a review of the results of extensive investigation into the standardization of tuberculin for human use, carried out at the State Serum Institute, Copenhagen. Biological methods of tuberculin standardization are briefly discussed and stress is laid on the fact that preparations required for intracutaneous testing in man must be standardized by a technique utilizing intracutaneous titration in the human being. It

is pointed out that divergent results are often obtained when intracutaneous and subcutaneous titration methods are compared, that intracutaneous tests in sensitized g. pigs are not necessarily paralleled by similar tests in tuberculous human beings and that all intracutaneous standardization methods in man are not equally reliable: e.g., the Danes find that the method used by SEIBERT & DUFOUR (1940) is unreliable unless a great number of persons with widely differing sensitivities are used.

Detailed information on the Danish procedure, involving preliminary standardization on g. pigs and final potency determination on human reactors is given. Among the many points stressed, the importance of siting in both the g. pig and the human being and the selection of patients with a steep tuberculin sensitivity curve, i.e., those reacting well to a dose of 0.00002 mg. and showing little or no reaction to 0.000005 mg., seem worthy of mention. It is also interesting to note that, despite the fact that tests on human beings are only repeated at intervals of 3-6 months, such persons are not regarded as suitable for repeated testing because the reactions tend to occur earlier and to become less well defined with each successive test.

The doses of the standard Purified Tuberculin (P.T. VII) used in Denmark are expressed in units, 1 unit being equal to 0.00002 mg. of the standard preparation and approximately equivalent to 0.01 mg. of International Standard O.T. It is pointed out that, as purified tuberculins cannot be standardized directly against O.T. for intracutaneous use, an international standard for purified tuberculin should be established as soon as possible.—J. LOCHIEL MCGIRR.

LÖFGREN, S. (1945.) **Primary pulmonary tuberculosis with erythema nodosum in connection with B.C.G. vaccination.**—*Acta med. scand.* 19. 231-239. [In English: author's summary copied *verbatim*.] 1699

Three cases of primary pulmonary tuberculosis with erythema nodosum occurring respectively 25, 14 and 24 days after B.C.G. vaccination are described. In all three cases, human tubercle bacilli were demonstrated in the gastric lavage fluid, and the possibility that the B.C.G. had been of direct etiologic significance in the origin of the disease could thus be definitely excluded. The author suggests instead that the vaccination may have played the part of provocative factor in producing erythema nodosum.

KERR, W. R., LAMONT, H. G., & MCGIRR, J. L. (1946.) **Studies on tuberculin sensitivity in the bovine.**—*Vet. Rec.* 58. 443-446 & 451-453. Discussion p. 454. 1700



A series of experiments was carried out in cattle to determine the effect of parturition on the tuberculin test and on the passive transference of skin sensitization to calves by the colostrum. The single intradermal method was employed for all tests, using Weybridge mammalian and avian tuberculin. The animals were tested 1-8 weeks before, and 1-14 days and 4-6 weeks after parturition. Colostrum drawn at various intervals was clotted and the clear fluid tested for precipitins against methyl alcohol-extracted antigens.

Of the 28 in-calf cows used, 20 were positive mammalian reactors to the anteparturition skin test. 1-14 days after calving, seven of the 20 were non-reactors, five were classed as non-specific and the remaining eight had a marked drop in sensitivity. After about six weeks all 20 reverted to their original level of skin sensitivity. The antigens from human and avian organisms gave a specific precipitin reaction with whey from cows affected with mammalian strains, but not with that from non-specific (to avian type) reactors. The antibody content of colostrum was very high immediately after calving, but dropped rapidly and had practically disappeared at the 120th hour.

Calf tuberculin tests indicated that of 13 offspring from reacting mothers, three only had evidence of skin sensitivity, while two were doubtful. This passive sensitivity persisted for about six weeks. Attempts to transfer antibody passively by means of blood serum from positive animals were unsuccessful. As the sera gave no reaction, however, to the precipitating antigen, they may have been below the critical level. The effect of antibody from the colostrum on skin sensitivity of the calf is discussed.

Further experiments were carried out to determine whether injections of tuberculin would reduce or abolish skin reactivity. With large doses of P.P.D. complete desensitization was produced, which in some cases persisted for several weeks. When the tuberculin was injected with liquid paraffin, so that absorption was delayed, the existence of desensitization was less obvious. It is suggested that, in some cases, the desensitizing mechanism destroys or neutralizes the sensitizing antibody. In other cases the antibody is not affected, but conditions are created which interfere with the reaction between the antigen and the antibody which is supposed to be closely associated with somatic cells.

In the course of these experiments it was found that following a single intradermal injection of tuberculin in a positive animal, the original site had an enhanced sensitivity to a second dose given 6-9 days later; it reached its maximum in the first 24 hours. This method was termed the Stor-

mont test. The first dose was 0.1 ml. of standard Weybridge mammalian or avian tuberculin and the boost dose, also 0.1 ml., was given on the seventh day. An increase of 5 mm. or more to mammalian tuberculin (nature of the reaction is ignored) was regarded as positive irrespective of the reaction produced by avian tuberculin.

A series of 300 animals which were tested and examined P.M. gave the following results:—When the single intradermal test was used, 17 infected animals were negative, 29 non-infected were positive and 27 (13 having no lesions) were doubtful. When the single comparative test was used, the corresponding figures were 27, 10, and 27. The Stormont test was regarded as much more efficient, since of 207 negative reactors only two had lesions when examined P.M. while of 93 positives, lesions were not found in three. This test had the additional advantage that it detected specific sensitivity in newly-calved infected cows, notwithstanding the fact that the seven-day interval between the initial and boosting dose fell within the period of returning sensitivity.

The new test failed to differentiate sensitivity engendered by a bovine infection from that due to skin TB.—R. E. GLOVER.

FLÜCKIGER, G. (1944.) Über die Verwertung von sogenannten Reagenten bei der staatlichen Bekämpfung der Rindertuberkulose. [The utilization of so-called reagents in the official control of bovine TB.]—*Schweiz. Arch. Tierheilk.* 86. 289-297. 1701

TB. control by the methods of Bang and Ostertag and by complete eradication are discussed. It is pointed out that the outlook is now very different from what it was in the earlier days, when the former methods were being worked out. There is now less tendency to draw distinctions between the different classes of infection and their relative danger with regard to spread of the disease.

The tuberculin reaction is discussed in some detail. It is stated that complete eradication cannot be undertaken in Switzerland and that the system used should be based on Bang's method, reactors being removed to herds where they are under strict control. Provided that the reactors maintain satisfactory health, they are kept in production; if their condition deteriorates, they are slaughtered. Only 10% of the cattle population was dealt with under this control scheme at the time of writing, but this was to be extended.

There is some discussion concerning the possibility that the tubercle bacillus undergoes a cyclical development in which there are ultra-microscopic stages that are infectious. Immunization is under investigation.—C. AHARONI.



FRANCIS, J. (1946.) **The tuberculin test and the control of bovine tuberculosis.**—*J. R. sanit. Inst.* 66. 355–362. Discussion pp. 362–365. 1702

This paper, presented at the Health Congress of the Royal Sanitary Institute in June, 1946, gives a resumé of the development of methods for the control of bovine TB. Improvements in the technique of tuberculin production, testing methods and their reliability, the spread of disease through the herd, the incidence of bovine TB in Great Britain, general control procedures (methods of Ostertag and Bang, vaccination and herd and area eradication), and control measures now in force in Great Britain and possibilities for the future are all discussed. Major points made are (a) that public health legislation relating to milk has done little to provide a progressive means of increasing the number of TB-free herds, (b) that if further substantial progress is to be made with the Attested Herds Scheme, eradication on an area basis must be commenced, (c) that there is no reason why Great Britain, which has been the most successful country at eradicating the major zymotic diseases of animals, should not be equally successful in the case of TB., (d) that any attempt to eradicate the disease from all parts of the country simultaneously is impracticable and that, therefore, eradication in selected areas of low disease incidence should be the first step in any programme, (e) that the disposal of reacting animals will have to be subjected to control and (f) that the success of any eradication scheme will depend on the provision of adequate compensation to the farming community and on the development of a public opinion enlightened as to its financial and public health benefits.

In the discussion, DALLING stressed the economic loss sustained by the farming community and the State from the present high incidence of the disease, mentioned the danger of man as a source of both human and bovine types of infection in cattle, discussed briefly vaccination with BCG and vole bacilli, made reference to the specificity of the tuberculins used in testing and to testing methods and remarked that, despite the development of antibiotics, the major bias in respect of bovine TB. must always be in the direction of prevention of infection rather than in the cure of the infected.

—J. LOCHIEL MCGIRR.

HEILMAN, D. H., & FELDMAN, W. H. (1946.) **Specific cytotoxic action of tuberculin. Studies on tissues of tuberculous rabbits in which negative cutaneous reactions to tuberculin have developed.**—*Amer. Rev. Tuberc.* 54. 312–318. [Spanish summary. English summary and conclusions copied *verbatim*.] 1703

A tissue culture method was used to study

the specific cytotoxic action of tuberculin on tissues from tuberculous rabbits in which negative cutaneous reactions to tuberculin had developed. The results of tests done with 5 rabbits in the terminal stages of progressive experimental tuberculosis indicated that a definite cellular sensitivity to tuberculin was present in each instance. Four experiments were done with tissue from rabbits with mild experimental tuberculosis which had become skin-test negative to tuberculin while they were suffering from intercurrent infections. In 3 experiments of this series a definite cellular hypersensitivity to tuberculin was observed, and in one experiment the results obtained were ambiguous.

It is concluded that a so-called spontaneous loss of cutaneous hypersensitivity to tuberculin in the course of experimental tuberculosis was not accompanied by a decrease or loss of cellular hypersensitivity.

FLÜCKIGER, G. (1943.) Ueber das Zustandekommen und das Wesen der Tuberkulinreaktion. [**Character and nature of the tuberculin reaction.**]—*Festschrift Oskar Bürgi, 1943.* pp. 109–122. Horgen-Zürich: Fritz Frei. [In German.] 1704

F. reviews the published evidence relating to the character and nature of the reaction elicited by tuberculin in the tuberculous subject, stress being laid on the fact that our knowledge is almost entirely dependent on numerous experiments in the domain of allergy and anaphylaxis and that the chemical basis of much of the work quoted is uncertain. Practically the whole of the discussion is derived from BORDET's book "*Traité de l'immunité dans les maladies infectieuses*" [V. B. 10. 484] and there is little or no reference to any American work. In conclusion a plea is advanced for more detailed basic information, not only from the purely scientific viewpoint but also in order that confidence in test efficiency should be retained with the avoidance of misinterpretation of test results.—J. LOCHIEL MCGIRR.

CORPER, H. J., & STONER, R. E. (1946.) **Passive transfer of local allergic hypersensitiveness to tuberculin.**—*Amer. Rev. Tuberc.* 54. 305–311. [Spanish summary. English summary copied *verbatim*.] 1705

No evidence was obtained to indicate that a mixture of citrated whole blood from normal or tuberculo-(tuberculin) allergic hypersensitive guinea pigs, with or without tuberculin, tended to produce a reaction when injected intracutaneously into normal or tuberculo-(tuberculin) allergic hypersensitive guinea pigs other than that normally produced by blood or tuberculin alone in these same guinea pigs.



Even though *in vitro* evidence from *in vitro* phagocytosis experiments and tissue culture studies indicated the existence of the toxic effect of tuberculin on phagocytic blood cells, there does not appear to be any evidence that tuberculin mixed with citrated blood from tuberculo-allergic hypersensitive (to tuberculin) guinea pigs produces a toxic substance for normal guinea pigs. Nor is there evidence that it retards or accentuates the natural tuberculin reaction in tuberculo-allergic hypersensitive guinea pigs to a sufficient extent to be of practical value for determining the existence of the tuberculo-allergic hypersensitive condition from the blood.

HOLM, J. (1946.) **BCG vaccination in Denmark.**—*Publ. Hlth Rep., Wash.* 61. 1298-1315.  
[Author's conclusions copied *verbatim*.] 1706

BCG vaccination is absolutely safe. When the proper technique of vaccination is employed by experienced vaccinators, the complications after BCG vaccination are relatively few.

It is very important to keep the virulence of the BCG strain at the proper level and to watch closely the variations of its virulence.

The vaccination gives considerable, but not absolute, protection. It protects almost completely against the morbid phenomena accompanying the tuberculous primary infection, and it also affords a considerable protection against genuine tuberculosis of the various organs—in particular, against phthisis.

\*EDILIO, B. (1941.) Azione degli ormoni sulla reazione alla tubercolina. [**Influence of hormones on the tuberculin reaction.**]—*Amm. Ist. Maragliano.* 11. 111. [Abst. in *Amer. Rev. Tuberc.* 52. No. 3. p. 52 of absts., copied *verbatim*.] 1707

Hormones and tuberculin were injected at the same time into children with clinical and X-ray evidence of tuberculosis. Total extract of the thyroid and thyroxin enhanced, in the majority of cases, the skin reaction to tuberculin; extracts of the parathyroids and pituitrin usually caused a decrease in the intensity of the reaction. Adrenalin caused a slight decrease in about 50 per cent of the cases; hypophysin increased the reaction in some cases, whereas the thymus had no effect at all. An explanation of these phenomena is attempted; (1) these hormones act differently on the neurovegetative system and on the nerves which control the vessels; (2) in tuberculosis the vegetative system is altered in varying degrees.

HOUSTON, J., HARKNESS, J., & WHITTINGTON, R. B. (1945.) **Plasma viscosity in pulmonary tuberculosis and other diseases.**—*Acta tuberc. scand.* 19. 153-183. [In English: authors' summary copied *verbatim*.] 1708

A method of correlating the results for differ-

ent viscometers used with blood plasma is described.

Plasma viscosities and controlled sedimentation-velocities are displayed in a pattern on which is based clinical groupings in pulmonary tuberculosis. The incidence of pleural effusions in this pattern is described. An average viscometric distribution of M. and H. groups in pulmonary tuberculosis is given. The phenomenon of terminal decay is described in terms of viscosity. Plasma viscosity thus provides a new method of assessing clinical condition in pulmonary tuberculosis, having been tested in 223 cases. 645 plasma viscosity measurements have been made.

VERLINDE, J. D., & BEKKER, J. H. (1945.) Besmetting van de cavia met paratuberkelbacillen. [**Artificial infection of g. pigs with John's disease.**]—*Tijdschr. Diergeneesk.* 70. 329-333. 1709

The authors refer briefly to the literature dealing with the pathogenicity for g. pigs of various acid-fast bacilli emulsified in a fatty base. They record the lesions observed in 40 g. pigs, each of which had received 5 mg. of live culture of *M. johnei*. Group I (ten animals) were injected subcutaneously in the thigh with bacteria suspended in physiological saline. Group II (ten animals) received the same dosage of this saline emulsion intraperitoneally. Group III (nine animals) received the organisms, emulsified in liquid paraffin and inoculated subcutaneously into the thigh, and Group IV (11 animals) received the oily emulsion intraperitoneally. These animals were killed at various intervals (14, 28, 42, 56 and 90 days) and the organs were examined histologically and bacteriologically.

Two animals in Group I, killed after 14 days, had affections of the associated inguinal lymph nodes. In one the node was oedematous and in the other there was abscess formation. The liver of an animal killed on the 28th day contained a few nodules (tubercles) composed of epithelioid cells surrounded by a zone of lymphocytes. 70% of the animals in group II had nodules in the liver. Two of the animals also had nodules (epithelioid tissue and giant cells) in the spleen. All animals in group III had affections of the associated inguinal lymph nodes. Histologically the granulation tissue consisted of epithelioid cells, giant cells, lymphocytes and fibroblasts. In some cases the centre of the nodule consisted of an accumulation of leucocytes (abscess formation). 50% of the livers had nodules, and in one animal they were also present in the lungs. In group IV, there were four deaths (one after 19, two after 30 and one after 75 days). Eight animals developed severe peritonitis accompanied by ascites. Nodules were present in the spleens, livers and lungs



of three, eight and five animals respectively.

In none of the experimental animals in any of the groups were any lesions suggestive of Johne's disease encountered in the intestinal tract. *M. johnei* is not completely apathogenic for g. pigs. The lesions evoked by subcutaneous and intraperitoneal inoculation of oily emulsions of the organism cannot be differentiated histologically from those induced by *M. bekkarii* or killed BCG inoculated similarly. The nodules in the liver seem to be identical with those recorded in the livers of cattle affected with Johne's disease. The authors discuss whether the skin reaction with Johnin is specific and observe that although the g. pig may not be a suitable experimental animal for differentiating between the various acid-fast saprophytes, it may be used to investigate the specificity of Johnin and other "paratuberculinins."—P. L. LE ROUX.

PETHERICK, M. H., & SINGER, E. (1943.) **The biological detoxication of bacterial toxins.**—*Aust. J. Sci.* 5. 137–140. 1710

The destruction of *Corynebact. diphtheriae* toxin in the animal body has been investigated by tests on g. pigs. Toxin destruction occurs mainly in the organs and there is a latent period before destruction begins. Destruction is favoured by the presence of iron, copper or zinc. *In vitro* experiments showed that metal compounds by themselves had no effect on the toxin, but were rendered active by the addition of redox substances. The significance of these findings is discussed.—D. F. STEWART.

RAO, S. B. V. (1946.) **Swine erysipelas.**—*Indian vet. J.* 22. 425–427. 1711

R. describes an outbreak of swine erysipelas and control measures (serum-vaccine) used on the Army Development Farm, Deolali, in 1945.—S. GUHA.

HAGMAYER. (1945.) Ferkelaufzucht, Rotlauf der Schweine, Impfzwang und seine volkswirtschaftliche Bedeutung. [Piglet rearing, swine erysipelas, compulsory inoculation and its political-economic importance.]—*Tierärztl. Z.* No. 2/3. pp. 24–25. 1712

H. discusses the wartime difficulties of fattening pigs and refers to the practicability of immunizing piglets against swine erysipelas by the culture plus antiserum method and of obliging breeders to do this before they are sold at about ten weeks of age to farmers and smallholders for rearing.

This raises a number of questions not yet satisfactorily answered, such as (1) Can inoculated piglets develop a useful immunity at an early age, when their reticulo-endothelial system is not fully developed? (2) What are the correct amounts of

culture to use for an initial inoculation at eight weeks of age and for a second inoculation with culture at ten weeks? (3) What is the correct amount of serum? (4) Can piglets be safely immunized in winter? (5) At what age should breeding pigs, immunized as piglets, be re-immunized, and if re-immunized repeatedly, at what intervals?—J. E.

FRITZSCHE, K., & RÖSLER, M. (1944.) Beitrag zur Diagnostik der pectoralen Form der Wild- und Rinderseuche (Pasteurellosis bovim). [Diagnosis of the pectoral form of bovine pasteurellosis.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 361–365. 1713

The authors give quotations from the literature to support their theory that the pectoral form of bovine pasteurellosis is a clinical entity and describe their investigations on 28 pairs of lungs from cattle emergency-slaughtered after being sent some distance by railway.

The characteristic finding was a more or less severe acute sero-fibrinous pleuritis with fibrin layers and a croupous pneumonia of varied location. The interlobular septa of the affected parts were oedematous and much thickened and the demarcation between affected and healthy lung tissue sharp. The bronchi contained either a reddish foamy or a purulent exudate. The associated lymph nodes were swollen and very moist on section. The histological appearances are also described.

In bacteriological examination, using fresh blood agar plates, the authors obtained a pure culture of diplococci from five cases and diplococci in mixed culture from the remainder. On subculture these organisms behaved like typical *pasteurella*.

The infection was transmitted to g. pigs by the intraperitoneal inoculation of cotton wool-filtered lung exudate and the organisms were duly recovered, whilst g. pigs inoculated with bacteria-free lung exudate filtrate remained healthy. Similar tests were made with other experimental animals, including a calf.

On the basis of this work, recommendations for the diagnosis of a pectoral form of bovine pasteurellosis are made. It is also suggested that this disease should be considered in the German meat inspection regulations.—J. E.

RAMON, G., RICHOU, R., & RAMON, P. (1944–45.)

De l'antagonisme microbien en général et en particulier des propriétés antagonismes des filtrats de culture du *B. subtilis* à l'égard de certaines bactéries et des toxines microbiennes. Etude expérimentale préliminaire. [Microbial antagonism: antagonistic properties of culture of *B. subtilis* with regard to certain bacteria and



microbial toxins.]—*Rev. Immunol.* 9. 161-217. 1714

The authors discuss the properties of *B. subtilis* filtrates prepared from ten-day-old cultures in either Sauton's synthetic medium or a medium consisting of bran extract as base plus barley or malt barley or sodium acetate. Most experiments were performed with anthrax and diphtheria bacilli and filtrates were shown to be not only bacteriostatic and bactericidal but also strongly bacteriolytic. They were active also against *Corynebact. ovis*, dysentery bacilli, *Past. pseudotuberculosis* and *Past. pestis*. They did not act on staphylococci. The batches varied a good deal, quite unpredictably. In general, the antibacterial and the gelatinolytic activity of the filtrates were correlated, but whereas heating to 70°C. destroyed the gelatinolytic activity, heating to 90°C. and for *B. anthracis* even to 125°C. did not affect the bactericidal power. The addition of 0.1 ml. formalin to 100 ml. filtrate also left the antibiotic activity unimpaired.

*B. subtilis* filtrates have a destructive action on certain bacterial toxins; this action is strongest and most rapid against diphtheria toxin and the haemolysin of *Staph. aureus*, weaker, but marked against the toxins of clostridia and almost absent for abrin and cobra venom. The authors suggest that the filtrates can be improved by selecting the right strains, by improving the medium and by finding the best methods for concentration and purification. The clinical application of such filtrates might then be possible and might lead to interesting results.—A. M.-H.

STUART, C. A., WHEELER, K. M., MCGANN, V., & HOWARD, I. (1946.) **Motility and swarming of some Enterobacteriaceae.**—*J. Bact.* 52. 519-524. 1715

Organisms of the paracolon group, commonly regarded as motile but not spreading, had a moderate surface spread on agar of low concentration. Agar stabs revealed a very marked sub-surface spread comparable in extent to that of *Proteus*. The surface spreading could be enhanced by serial transfers first over semisolid (0.25%) agar, then over 1% agar. Such "conditioned" cultures spread like *Proteus* culture.

Some non-motile typhoid strains and a strain of *Shigella alkalescens* produced after prolonged culture in semisolid agar motile variants with the ability to spread. With regard to the motility in strains of *Shigella* found by other workers, the authors suggest that the non-motility of a culture may not be a fixed characteristic.—A. M.-H.

HAYSTON, J. T. (1946.) **Enteric diseases of swine. I. Salmonellosis in swine.**—*Aust. vet. J.* 22. 182-185. 1716

GORRIE, C. J. R. (1946.) **Enteric diseases of swine. II. Swine dysentery.**—*Ibid.* 185-187. Discussion pp. 187-188. 1717

I. A general account is given of the symptoms and findings P.M. of salmonellosis in pigs as seen in New South Wales. It is considered that the healthy carrier is responsible for most outbreaks which frequently occur after the introduction of purchased pigs. The disease varies in nature from peracute to chronic forms. A slide agglutination test with antisera to *S. cholerae-suis* and *S. typhi-murium* is used as a rapid routine technique for identification of the organisms isolated.

II. The difficulty in distinguishing swine dysentery from infection with *S. cholerae-suis* is stressed. However, salmonella organisms are not constantly present in cases of swine dysentery.

Several serial transmission experiments are described, in which the inoculum consisted of the contents of the large bowel given by stomach tube. In each series a case occurred which was not typical of swine dysentery and from one of these the disease was successfully transmitted. It is considered that about 10% of normal pigs are resistant. In the field [in Victoria] the disease is very variable in its pathogenicity and has little relation to hygienic conditions.

In the ensuing discussion attention was drawn to the successful use of hygiene in control of disease in the U.S.A. As swine dysentery has proved very difficult to transmit in New South Wales it was questioned whether the disease was the same in Victoria and New South Wales.

—D. F. STEWART.

SHIRLAW, J. F., McDONALD, S., & HAYES, W. (1946.) **A case of canine *S. typhimurium* infection with notes on other salmonella infections in animals.**—*Indian vet. J.* 22. 251-255. 1718

The authors report the isolation of a strain of *S. typhi-murium* from pus in the uterus of a bitch which aborted after a week's febrile illness.

—V. R. RAJAGOPALAN.

WILSON, J. E. (1946.) **Fowl typhoid. Certain aspects of the experimentally produced disease.**—*Vet. Rec.* 58. 269-271. 1719

A number of experiments were carried out in order to study the apparent variation in virulence of *S. gallinarum*, the spread of infection by contact, the value of vaccination, the behaviour of carriers of *S. pullorum* when exposed to infection and the agglutination test as a means of detecting carriers.

It was found that there was a marked variation in virulence with different strains of the organism and that virulence was rapidly lost by sub-cultivation. Although only small numbers of



fowls were used, it is of interest to note that carriers of *S. pullorum* did not die from fowl typhoid following injection or exposure to infection with *S. gallinarum*. The use of dead vaccines proved of doubtful value in preventing the disease, but the rapid whole-blood aggl. test using stained *S. pullorum* antigen was effective in detecting carriers of fowl typhoid.—J. D. BLAXLAND.

VERWEY, W. F., & SCHEIDY, S. F. (1946.) **Brucella abortus vaccine (strain 19) desiccated by lyophilization.**—*J. Amer. vet. med. Ass.* 109. 362–365. 1720

Strain 19 vaccine in saline suspension has a limited period of viability which cannot be relied upon much beyond three months. Exposure to high summer temperatures and perhaps excessive agitation tend to curtail the viable period. Vaccine prepared by desiccation from the frozen state by lyophilization has now been produced commercially for about a year. Skimmed milk is used as the stabilizing agent. After freezing at the temperature of dry ice, vaporization direct from solid to gaseous form is carried out by means of a high vacuum. The technique of preparing and testing the vaccine is described.

Tests of the stability of vaccine prepared in this way have been carried out and vaccine has been found to be satisfactorily stable at refrigerator and room temperatures for at least three years, but the full period of viability has not yet been ascertained. Maintained at 100°F., it appears to remain stable for at least six months.—S. J. G.

\*SCHÖCH, A. (1943.) **Skin lesions in brucellosis.**—*Praxis.* 32. 581–594. [Abst. in *J. Amer. med. Ass.* 125. 457., copied *verbatim*.] 1721

Ten per cent of all veterinarians in Switzerland acquired cutaneous lesions after obstetric interventions on animals infected with *Brucella abortus*. According to Schoch these lesions are due to an allergic reaction of the skin to contact with brucella organisms. Acute brucellosis does not need to be present, because cutaneous lesions were seen not only in persons who had had brucellosis but in some who never had it. If the exanthems do not accompany acute brucellosis, the general condition may be good; fever and swelling of lymph nodes may be absent. The most frequent cutaneous manifestations are papulopustular eruptions and eruptions which resemble exudative erythema multiforme. The individual crop of efflorescences is rarely monomorphic; usually several forms concur. The differential diagnosis is difficult. Attempts to culture the brucella organisms from cutaneous blisters may fail because pus organisms grow more rapidly and thus obscure the brucella organisms. Subcutaneous inoculation into guinea

pigs may yield the organism. Brucellosis can be ascertained by cutaneous reaction. In the presence of suspicious cutaneous lesions in persons who have aided in the delivery of animals with *Brucella abortus* the cutaneous test is more reliable than the blood agglutination test. Vaccine has not proved effective in the treatment of cutaneous lesions of brucellosis. The author uses a sulfur-mercury mixture locally and a pyrazole derivative internally. Protection of hands and arms with oils or with rubber gloves and disinfection of hands are valuable prophylactic measures.

ROUX, L., & BOUVIER, G. (1946.) **Brucellose chez le lièvre. [Brucellosis in the hare.]**—*Schweiz. Arch. Tierheilk.* 88. 507–519. [In French.] 1722

The authors describe the lesions and results of cultural and biological tests in two cases (one in 1936 and the other in 1944) of *Br. abortus* infection in hares.—S. J. GILBERT.

POLDING, J. B. (1946.) **Some peculiarities in the germination of *Brucella*.**—*J. comp. Path.* 56. 215–236. 1723

In making serial dilutions of brucella in liver agar, it was observed that an abrupt cessation of germination occurred in the series. Experiments are described which show that an inhibitor occurs in liver, the ultimate action of which is bactericidal.

Germinating brucella, when in sufficient numbers, produce an anti-inhibitory factor which nullifies the effect of the inhibitor. This factor was not found to be produced with dead cells, live non-germinating cells or cell washings. There were differences among various strains of brucella as to the dilutions at which growth completely ceased.

A number of experiments were performed to ascertain the effect of modifications of technique and of filtration or heating of liver preparations. The effect of dialysis and ultra-filtration was studied, together with the blood factors which affect germination.—S. J. GILBERT.

OAKLEY, C. L., WARRACK, G. H., & VAN HEYNINGEN, W. E. (1946.) **The collagenase ( $\kappa$ -toxin) of *Cl. welchii* Type A.**—*J. Path. Bact.* 58. 229–235. 1724

A study was made of the factor in culture filtrates of *Cl. welchii* (Type A) which disintegrates muscle and reduces it to a pulp. The activity of six culture filtrates was measured after combination with each of a group of antitoxins in order to assess the relative neutralizing powers of the sera. In terms of an arbitrarily chosen unit, the antitoxins had a characteristic value when tested against each of the culture filtrates, which suggest-



ed that only one muscle-softening factor was present in the filtrates. Further combining tests proved that the muscle-softening toxin was immunologically distinct from  $\alpha$  toxin,  $\theta$  toxin and hyaluronidase. This  $\kappa$  toxin destroys the reticulum surrounding muscle fibres and also liver trabeculae. A few strains of Types B, C and D were examined, but only those of Type C produced a measurable amount, while filtrates of Type B and D cultures contained only traces. The azocoll test, which is described, is recommended for the assay of the anti- $\kappa$  values of sera. Azocoll consists of hide-powder [standardized ground up cattle skin obtainable commercially] coupled with an azo-dye. The dye is set free when there is excess  $\kappa$  toxin in the toxin-antitoxin mixtures.—J. KEPPIE.

DADOT, F. (1945.) Botulisme des canards. [Botulism in ducks.]—*Rec. Méd. vét.* **121**. 177–180. **1725**

D. comments on the rarity of references to the occurrence of botulism in poultry in France. He describes a case in which some farm-yard ducks became prostrate after being fed on badly preserved peas: in spite of the absence of any attempts to demonstrate the toxin, a diagnosis of botulism was made.—W. M. HENDERSON.

ROSENTHAL, S. R., & ROUTIEN, J. B. (1946.) The infectiousness of coccidioidomycosis.—*Science*. **104**. 479. **1726**

*Coccidioides immitis* infection is endemic in the San Joaquin Valley, California, as well as in parts of Texas, Arizona and New Mexico, and numerous soldiers trained there and now demobilized will have returned to other parts of the U.S.A. harbouring the fungus. The disease has been held to be non-contagious, with no direct man-to-man or animal-to-man spread, so that there is no reason for elaborate isolation. It is suggested that the spherule or endospore-filled sporangium stage of the organism requires a stage of development in nature to produce mycelial threads and chlamydospores before it becomes infective by the respiratory route for man and animals.

Experiments are now recorded, however, which show that spherule-containing material from human or g. pig lesions will produce, when instilled experimentally into the bronchi of g. pigs and propelled into the smaller bronchi and alveoli, typical lesions localized in the lungs and hilar lymph node.

It is concluded that, since the spherules from human or animal lesions are infective through the respiratory tract, all active human cases of primary or secondary coccidioidomycosis should be considered contagious until proved otherwise.

—E. COTCHIN.

429  
1945 DROBOTKO, V. G. (1945.) *Stachybotryotoxicosis, a new disease of horses and humans.*—*Amer. Rev. soviet Med.* **2**. 238–242. **1727**

An account is given of investigations made of a disease of horses which appeared in the Ukraine several years ago. Clinically it is characterized by irritation of the mouth, throat, nose and lips with desquamation of epithelium and swelling and tenderness of the submaxillary glands, followed by leucopenia lasting from several days to a month. In a small percentage of cases this is succeeded by a sudden rise of temperature and the development of foul necrotic ulcers in the mouth and throat, along with disseminated haematomas: such cases usually terminate in death.

The lesions found on examination after death are necrotic ulcers in the mucosa of the mouth, throat, nose, tonsils, stomach and intestines. There are numerous haemorrhages in almost all the organs. The spleen is not enlarged, but its surface is studded with minute haematomas. Lymph nodes are enlarged, engorged with blood and the colour of a ripe plum. The bone marrow is excessively pale. Microscopic examination reveals degenerative changes, chiefly in the liver, and the small veins often contain thrombi.

It was not possible to infect healthy horses either by placing them in contact with the sick or by administering saliva, blood, or organ emulsions from diseased horses.

The epidemiology of the condition suggested food-poisoning from contaminated hay as a likely cause. A search for such things as chemical poisons, poisonous plants and insects was negative.

On one farm where cases were occurring, part of the hay in a stack was found to be blackened as a result of the growth of a mould. A horse fed on this blackened hay fell ill in 36 hours and died after three weeks of a continued feeding, with typical clinical and pathological findings. The mould responsible for blackening the hay proved to be *Stachybotrys alternans*. Hay sufficiently infected with this mould invariably caused the disease when fed to healthy horses, while hay infected with other moulds did not. The disease could be set up by feeding hay artificially infected with cultures of the mould and also by feeding pure cultures. The severity of the disease varied directly with the quantity of culture fed.

In rabbits, horses and in man it was possible to produce a dermatitis, sometimes with necrosis, by rubbing either culture of the mould or boiled culture into the skin. By extraction of culture material with ether, a chemical substance in crystalline form was obtained which provoked the typical skin reaction. A horse injected intravenously with an ether extract of the mould



developed leucopenia and died. The pathological changes were typical of the disease, save that the mouth and lips were not affected. It was concluded that a chemical substance contained in *Stachybotrys alternans* was the cause of the condition.

Bacteria may play some part in producing a terminal complication. Streptococci and *Bact. viscosum equi* [*Bact. equirulis*] were isolated from some cases.

A similar condition was observed in human beings and was associated with the consumption in the spring of grain which had lain under snow during the winter.

*Stachybotrys alternans* is a saprophyte which grows well on damp hay or other dead vegetation. Prevention of the disease consists in keeping hay or other fodders dry so that the mould cannot grow. The name stachybotryotoxicosis is suggested for the disease.—M. C.

HARMON, D. R., ZARAFONETIS, C., & CLARK, P. F. (1946.) **Temperature relations in phagocytosis.** —*J. Bact.* 52. 337–347. [Authors' summary copied *verbatim*.] 1728

In a series of studies of phagocytosis *in vitro*, exudative guinea pig and rabbit polymorphonuclear leucocytes in a system with fresh homo-

See also absts. 1749 (skin reaction to killed TB. organisms in lymphogranulomatosis); 1757, 1758 (fleas transmitting plague); 1761 (staphylococci and demodectic mange); 1807 (salmonellosis in lambs); 1849 (chemotherapy of TB.); 1854 (penicillin and TB.); 1864 (antibiotics and clostridial infections); 1866 streptococcal mastitis); 1867, 1868 (disinfectants); 1870 (thermoduric bacteria in milk); 1871 (coliform organisms in milk); 1874 (staphylococcal mastitis); 1877 (staphylococcus and food poisoning); 1884–1890 (technique); 1901–1908 (annual reports).

logous normal serum and *Staphylococcus aureus* showed enhanced phagocytic powers with 5°C. increments within a temperature range of 22 to 42°C. These results are based on 10-minute incubation of the complete phagocytic system in a controlled water bath. Data here included are from the 15 tests (10 guinea pig and 5 rabbit) of which the techniques were the most satisfactorily standardized. In all, over 30 experiments were performed, and, regardless of variations in technique, the reaction showed the same trend.

Fifteen experiments with mice did not lead to clear-cut results; this was due to failure to secure an adequate leucocytic response. The results of the five tests in which there was a moderate amount of exudation are presented; they indicate an increased ingestion up to 37°C. followed by a decline at 42°C.

In five tests with guinea pig leucocytes and fresh homologous normal serum (vs. *Staphylococcus aureus*) in which the temperatures ranged from 37 to 45°C with 2°C increments and with comparisons at 25 and 50°C, phagocytosis increased to a point approximating 43°C and declined rapidly beyond that point.

The increase in phagocytosis proceeded at a slightly decreased rate as elevated temperatures were reached.

## DISEASES CAUSED BY PROTOZOAN PARASITES

MAROTEL & PIERRON. (1943.) Deux notes de clinique parasitaire: sur la coccidiose bovine et la toxoplasmose. [*Bovine coccidiosis and toxoplasmosis.*]—*Rev. Méd. vét., Lyon et Toulouse.* 94. 112–116. 1729

In view of the good results obtained with quinacrine in coccidiosis of rabbits, the authors employed this drug in the treatment of bovine coccidiosis. They claim that all but one of the 100 cases treated were cured. The earlier method consisted of administering quinacrine in 1% aqueous solution by the mouth at a dosage of 1 g. per 100 kg. live weight. Since, they have experimented with intravenous injections in ten serious cases. The drug was administered at a dosage of 1 g. per 100 kg. live weight and was dissolved in 20 ml. of distilled water. This treatment proved successful. The salt of quinacrine, methane-sulphonate, is completely soluble and at present is the only one suitable for injection into the blood.

Toxoplasmosis in rabbits is also described. It is contagious, epizootic and often produces a 40% mortality. It is identified by necrotic

tubercles which are most abundant in the spleen and, more rarely, in the liver, lungs and intestine. The symptoms are inappetence, extreme emaciation and anaemia. Arthropod vectors may be involved in the distribution of the parasite.

—C. HORTON SMITH.

GARD, S. (1945.) **A note on the coccidium *Klossiella muris*.**—*Acta path. microbiol. scand.* 22. 427–434. [In English: abst. from summary.] 1730

Of 96 male white mice aged seven months, the kidneys of about a third were infected by *Klossiella muris*.

The stages of conjugation and syngamy of the parasite were observed in one of the kidneys. Microgametocytes and macrogametes were distinguishable on certain cytological differences. The number of microgametes was normally two.

This suggests that *Klossiella* may belong to the subgroup Adeleidea among the *Coccidia* and indicates further a close relationship to the genus *Hepatozoon*.

HOVANITZ, W. (1947.) **Physiological factors**



which influence the infection of *Aedes aegypti* with *Plasmodium gallinaceum*.—*Amer. J. Hyg.* 45. 67–81. [Author's summary copied verbatim.] 1731

An effort was made to determine the physiological factors which influence the infection of the mosquito, *Aedes aegypti*, with chicken malaria, *Plasmodium gallinaceum*.

No genetic effects on infectibility in *A. aegypti* were encountered in 6 generations of selection. No parent-offspring correlations were found. It is possible that our colony of mosquitoes was homogeneous with respect to this condition and, therefore, not capable of genetic change.

A relationship between the amount of blood ingested by the mosquito and the number of cysts which it develops may be indicated. This is strengthened by weighting the amount of blood ingested to the body weight of the mosquito. Mosquitoes ingesting more than their own weight in blood have more cysts per female than females ingesting less than their own weight in blood.

Mosquitoes which develop more cysts as a group also lay more eggs. The mean number of cysts per female increases as the numbers of eggs increases. This is possibly an indication of a difference in the absorption of the blood after

See also absts. 1855 (paludrine and malaria); 1891 (technique); 1901-1908 (annual reports).

## DISEASES CAUSED BY VIRUSES AND RICKETTSIA

MÖHLMANN, H. (1944.) Simultanschutzimpfung gegen Maul- und Klauenseuche mit Vaccine und Immunserum. [Simultaneous inoculation against foot and mouth disease with vaccine and immune serum.].—*Arch. wiss. prakt. Tierheilk.* 78. 523–528. 1733

In 1938, STROTHOFF reported that the presence in cattle of passive immunity to foot and mouth disease was unfavourable to the use of vaccine in that the antibody of hyperimmune and convalescent serum appeared to neutralize the antigen of the vaccine and that this neutralizing action of the serum persisted longer than the passive protection afforded by the serum [see *V. B.* 9. 83].

M. now reports the results of experimental study of this phenomenon in connexion with the desirability of evolving a method for protection of cattle between the time of vaccination and the development of active immunity. Thirty-two cattle of 400–500 kg. weight were used for the administration of 200 ml. hyperimmune serum from 28 days before to three days after a 60 ml. dose of vaccine. When tested later by rubbing the tongue with a cloth soaked in virus suspension, 19 of these cattle reacted, as compared with no reactors in a group of four cattle receiving serum

digestion, as the number of eggs laid probably is indicative of the amount of food materials available for their production.

There is no correlation between the body weight of the mosquitoes and the infectibility.

Physiological factors involved in the infection of mosquitoes with malaria are discussed. These are of two sorts, one of a hereditary nature and the other of an environmental nature. The former is illustrated by species and strain specificity and the latter by individual variability with a homogeneous strain.

HOEKSTRA, J. (1942.) Naar aanleiding van een aantal secties op honden met uraemie en Weil-infecties. [Findings P.M. in dogs with uraemia and leptospirosis.].—*Tijdschr. Diergeneesk.* 69. 448–455. [English, French and German summaries: abst. from English summary.] 1732

H. studied the differential diagnosis P.M. in dogs of uraemia and leptospirosis.

In acute leptospirosis, the kidneys appeared to be macroscopically normal or had parenchymatous degeneration. Microscopically interstitial changes could be observed. Of great importance in diagnosis were the petechiae found in the pleura.

seven days after vaccination and no reactors in a group of 12 cattle receiving vaccine alone. The same type of result was obtained using g. pigs. A further experiment was done in g. pigs, in which it was found that vaccination 5–20 days after the simultaneous administration of vaccine and serum resulted in the development of immunity, but to a lesser degree than following a single injection of vaccine alone.

These results emphasize that the period without protection following vaccination cannot necessarily be covered by a simultaneous dose of immune serum.—W. M. HENDERSON.

REMLINGER, P., & BAILLY, J. (1942.) Vaccination antirabique des chiens après morsure. [Antirabies vaccination of dogs after being bitten.].—*Rev. Méd. vét., Lyon et Toulouse.* 93. 105–114. 1734

The authors do not agree with the opinion that it is inadvisable to vaccinate dogs which have been bitten and consider that this should be permitted in selected cases, particularly in dogs which before being bitten had had prophylactic inoculation. The authors inoculated 73 dogs after they had been bitten, giving 3–10 injections, according to the severity of the bites received.



Each injection consisted of 40 ml. of a phenolized or etherized vaccine. Seven of the animals had been bitten by dogs which had been proved rabid by biological tests, 14 had been bitten by dogs diagnosed as rabid after observation by a veterinarian, and 53 had been bitten by dogs suspected of rabies.

In no case did any of the treated dogs develop rabies within a period of three months after treatment.—M. C.

BAILLY, J. (1946.) *Forme prurigineuse de la rage du chien. [A case of rabies with marked symptoms of pruritus in a dog.]—Bull. Acad. vét. Fr. 19. 155-159. 1735*

A case of rabies characterized by intense pruritus of the hind quarters is described. The pruritus was present for 48 hours before death, but no aggressive symptoms were shown at any stage of the disease. On examination P.M. the bladder was found to be distended with urine which contained glucose. A diagnosis of Ajuszky's disease had been made from the clinical symptoms, but inoculation of an emulsion of the hippocampus into white mice, rats and a rabbit showed the disease to be rabies.—M. C.

ANON. (1946.) *How to vaccinate.—Lancet. 251. 350-352. 1736*

The public response is discussed, in view of the probable introduction of voluntary infant vaccination against smallpox.

The influence of the technique of vaccination on the incidence and severity of local reactions is an important factor in obtaining a successful public response. Comparative studies are recommended on a statistical basis of the three main techniques of vaccination: dermal scratch, multiple pressure and intracutaneous prick.—P. F. S.

THIÉRY, J. P., & SALOMON, L. (1945.) *Contribution à l'étude de la peste porcine. [Swine fever in North East France.]—Rec. Méd. vét. 121. 202-208. 1737*

A short report of the occurrence of swine fever during February, 1945, in North East France.—W. M. HENDERSON.

MICHELSSEN, E. (1946.) *Hundesygevirus-Pluralitet. [On the plurality of dog distemper virus.]—Maanedsskr. Dyrlaeg. 58. 142-144. 1738*

In a discussion on this problem reference is made mainly to the work of VERLINDE (1946), who demonstrated the existence in dogs of an acute specific encephalitis immunologically distinct from dog distemper; the condition was observed in dogs which have been immunized against the latter or have recovered from a natural attack. VERLINDE named the "new" disease as a form of distemper caused by a distinct type of dog distemper virus [although why it should not be

regarded as a distinct disease is not at all clear].—J. E.

BEEUWKES, H. (1940.) *Over een ziekte bij de cavia, veroorzaakt door een op een virus gelijkend agens. [A virus disease of g. pigs.]—Geneesk. Tijdschr. Ned.-Ind. 80. 411-419. 1739*

In the laboratory examination of a case of dermatitis polymorpha dolorosa in a human being, B. demonstrated a filtrable virus-like agent transmissible to g. pigs but not to monkeys, rabbits or mice. Control tests showed it to have no connexion with the skin disease in question and it must be considered as autochthonous in the g. pig. It had an incubation period of 5-30 days; clinical fever was the only symptom. Pathological anatomical examination of the g. pig revealed the peritoneum red and bleeding and lymph nodes light red in colour. The agent was inactivated by heating at 65°-70°C. for 15 min.—S. M. G.

NELSON, J. B. (1946.) *Studies on endemic pneumonia of the albino rat. I. The transmission of a communicable disease to mice from naturally infected rats. II. The nature of the causal agent in experimentally infected mice.—J. exp. Med. 84. 7-14 & 15-23. [Author's summaries copied verbatim.] 1740*

I. A specific disease entity was established in white mice by the nasal instillation of lung and exudate suspensions from each of 14 adult albino rats affected with endemic pneumonia.

The induced disease was characterized by pneumonia (96 per cent), otitis media (94 per cent), and rhinitis (30 per cent). It progressed slowly after an incubation period of 7 to 14 days and was attended by a variable mortality which reached 33 per cent in 22 weeks.

Maintenance of the disease was regularly accomplished by direct transmission from mouse to mouse but only by the nasal route and only from the three foci of involvement. It was also transmissible by direct contact but required a prolonged period of exposure. The relation of the disease to infectious catarrh, which is closely resembles, is discussed.

II. Coccobacilliform bodies, pleuropneumonia-like organisms, or other cultivable pathogenic bacteria were not demonstrable in lung and exudate suspensions from selected adult rats naturally infected with endemic pneumonia or from experimentally infected mice.

The specific factor in lung suspensions from mice was identified with an agent which was active on dilution through 10<sup>7</sup>. It failed to pass through Berkefeld N filters but was generally present in V filtrates, with a loss in titer up to 1000-fold. It was largely removed from suspension on centrifugation at a speed of 9000 R.P.M. for 30 minutes.



Attempts to cultivate the agent in embryonated eggs were uniformly unsuccessful. In fluid suspension it failed to withstand storage at 40°C. for a week but remained viable for at least 3 months in a frozen state under dry ice.

The relation of the infective agent to viruses and to pleuropneumonia-like organisms is discussed.

CORONEL, A. B. (1947.) **Adsorbate Newcastle disease (avian pest) vaccine.**—*Amer. J. vet. Res.* 8. 120-127. 1741

C. investigated four methods of treatment of Newcastle disease virus in an effort to produce an attenuated or an inactivated virus for use in vaccine production. These were (1) serial passage in the developing hen egg, (2) storage of virus suspensions at varying pH values, (3) desiccation and (4) formalin treatment of alumina-adsorbed virus. Over 100 egg passages failed to attenuate the virus for adult birds. Pronounced acid and alkaline solutions destroyed the virus and its antigenic properties, whereas neutral and slightly alkaline solutions favoured long survival without attenuation. Only long storage following desiccation produced inactivation, but without potent antigenic action. The use of alumina gel in phosphate buffer, pH 7.2-7.4, with the addition of 0.1% formalin to infective chick embryo tissues and fluids proved to be the most effective method of treatment of the virus for vaccine production. Vaccine prepared in this manner was used experimentally and in the field in doses of 0.25 ml. for birds of 4-6 months, 0.5-1.0 ml. for pullets and cockerels and 1-2 ml. for adults, with results described as highly satisfactory.—W. M. H.

ANON. (1946.) **National Committee on Newcastle disease [pneumoencephalitis].**—*J. Amer. vet. med. Ass.* 109. 351. [Report also appeared in *Fed. Vet.* 3. No. 5. 4.] 1742

This report lists certain recommendations adopted by the U.S.A. National Committee on Newcastle Disease. The recommendations emphasize the need for early diagnosis by suitable laboratory procedure, the precautions necessary at laying trials and in hatcheries, the sanitary disposal of carcasses and offals and the suitable disinfection of equipment and crates used by poultry. The need for further research, particularly in methods of vaccination, is stressed.—D. L.

ACEVEDO, R. A., & MENDOZA, I. L. (1947.) **Chicken embryo vaccine against Newcastle disease [pneumoencephalitis].**—*Amer. J. vet. Res.* 8. 91-102. 1743

Various methods designed to modify Newcastle disease virus in order to produce an effective vaccine were attempted.

Serial passage of the virus 100 or more times

through chick embryos, storage of the virus at various pH values, and desiccation did not produce the desired effect. A satisfactory vaccine was prepared from infected chick embryos and fluids, inactivated with 0.1% formalin and treated with alumina gel. 75,000 doses of this vaccine were issued for field use and gave good results [no figures given].—F. D. ASPLIN.

HOWE, H. A., & BODIAN, D. (1947.) **Attempts to infect African green monkeys by oral administration of poliomyelitis virus.**—*Amer. J. Hyg.* 45. 223-225. [Authors' summary copied *verbatim.*] 1744

Each of 10 African green monkeys, *Cercopithecus aethiops sabaeus*, was fed approximately 600,000 LD<sub>50</sub> doses of poliomyelitis virus. The animals showed no clinical or pathological evidence of poliomyelitis, nor was virus detected in their stools. Intracerebral titration of the same material in 12 rhesus and 12 green monkeys showed the two species to be equally susceptible.

FOLEY, G. E., & AYCOCK, W. L. (1945.) **Alterations in the autareeologic susceptibility of the mouse to experimental poliomyelitis by estrogenic substances.**—*Endocrinology.* 37. 245-251. 1745

Treatment of spayed female and normal male and female mice with alpha-oestradiol propionate or diethylstilboestrol produced no enhanced resistance to infection by intracerebral or intraperitoneal injection of poliomyelitis virus. The same treatment, however, enhanced resistance to infection with the same virus instilled intranasally. The authors suggest that this enhanced resistance to intranasal instillation of the virus in oestrogen-treated mice is due either to a "barrier effect" in the upper respiratory mucous membranes or to some change in cellular affinity to the virus, such a change operating outside the central nervous system.—W. M. HENDERSON.

MELNICK, J. L. (1947.) **Poliomyelitis virus in urban sewage in epidemic and in nonepidemic times.**—*Amer. J. Hyg.* 45. 240-253. [Author's summary copied *verbatim.*] 1746

Consecutive tests for poliomyelitis virus in urban sewage in epidemic and in nonepidemic times have been carried out. Various techniques for isolating poliomyelitis from sewage have been developed and the most sensitive has proven to be a combination of ammonium sulfate precipitation followed by further concentration in the ultracentrifuge.

During the 1943 epidemic in Chicago, Ill., poliomyelitis virus was detected in the effluent from Imhoff settling tanks on two occasions, 17 days apart. Virus was also found in raw sewage at a plant serving another part of the city, in



sewage leaving a hospital with poliomyelitis patients, and in sewage collected from a residential area in which no persons with manifest poliomyelitis were living at the time and in which none subsequently developed. When the epidemic subsided all sewage tests were negative.

Monthly tests for poliomyelitis virus in New York City raw sewage, collected at a disposal plant having a tributary human population of 625,000 have been carried out from 1940 through 1945. In 4 of the 6 years virus was detected in the sewage, occasionally when there were as few as 4 or 5 manifest cases in the area during the month. Virus was not detected in 2 of the 6 years, and in one of these years, no cases were reported in the tributary area.

Virus was detected only in late summer and fall months in New York. In 2 of the 4 years in which virus was detected, it was present for long duration: 15 days in 1941, and 4 months in 1944. In the latter year, poliomyelitis was mildly epidemic in New York City.

Calculations have been made which show that in Chicago, 6,000,000 monkey infectious doses of virus were leaving a sewage disposal plant per minute at the time of collection; and that in New York, 500,000 doses per minute were entering a sewage collection station.

Upon the basis of titration experiments in monkeys, it was found that a 100-gram stool may contain 10,000 monkey infectious doses of virus. Calculations dependent upon these data suggest that approximately 6 per cent of the people on Manhattan in New York City may have been carriers of poliomyelitis virus in the autumns of 1940, 1941, 1944 and 1945.

BODIAN, D., & CUMBERLAND, M. C. (1947.) **The rise and decline of poliomyelitis virus levels in infected nervous tissue.**—*Amer. J. Hyg.*, **45**, 226-239. [Authors' summary copied *verbatim*.] 1747

Levels of Lansing poliomyelitis virus in the spinal cords of infected rhesus monkeys during the first 3 weeks of the disease were studied. Samples of cord tissue were titrated in mice, using 10-fold dilutions. Samples with virus below the mouse infectivity threshold were tested for virus by inoculation in rhesus monkeys.

Virus was first detected in cord segments when lesions were first demonstrable histologically, namely, on the day preceding paralysis in our material.

Peak concentrations of virus are achieved within 1 day after virus is first demonstrated and maximal concentrations are maintained for an average period of 2 days. These 2 days are the day preceding paralysis of the limb corresponding

to spinal cord segment, and the first day of paralysis.

A sharp dampening effect on virus multiplication occurs on about the second day of paralysis, and on the third day most cord segments have virus concentrations below the mouse infectivity threshold. Virus, however, can subsequently be detected for at least 2 weeks by subinoculation in rhesus monkeys.

In our material, leg paralysis with Lansing virus follows arm paralysis by about 1 day, and the entire virus "growth-curve" is correspondingly shifted in lumbar cord as compared with cervical.

Since peak concentrations of virus may occur during the early stages of pathological change, before sufficient motoneurons are destroyed or so injured that clinically evident paralysis occurs, and since virus levels decrease after the first day of paralysis, it follows that correlations of virus titer and severity of paralysis cannot be adequately made.

The stage of the disease during which a sample of virus was obtained appeared to have no influence on the incubation period in animals inoculated with that sample.

For the purpose of obtaining suspensions of maximal virus concentration, it is best to harvest the spinal cord on the first day of paralysis. At this time both cervical and lumbar cord should have high concentrations, regardless of degree of paralysis.

HOWE, H. A., & BODIAN, D. (1947.) **Isolation of poliomyelitis virus from the throats of symptomless children.**—*Amer. J. Hyg.* **45**, 219-222. [Authors' summary copied *verbatim*.] 1748

Poliomyelitis virus was isolated from the throats of one of 3 patients with poliomyelitis and from one of 6 juvenile family contacts, but not from 5 adult familial, 7 juvenile or 6 adult extra-familial contacts of these cases. Virus was present in the throats of at least two of 28 healthy children from a neighbourhood playground. One year later these children were shown to have antibody against the viruses isolated from them. The method, here employed, of testing pools of throat swabs is thought to have been a poor one because of the increased probability of encountering antiviral substances: hence only the positive results can be stressed.

WARFVINGE, L. E. (1945.) **Über eine von abgetötenen Tuberkelbazillen hervorgerufene Hautreaktion bei Lymphogranulomatosis Benigna.** (Vorläufige Mitteilung.) [A skin reaction provoked by killed tubercle bacilli in human lymphogranuloma benigna.]—*Acta*



*tuberc. scand.* 19. 126-141. [In German: English summary copied *verbatim*.] 1749

Preliminary report of a histologically specific skin reaction in lymphogranulomatosis benigna. The reaction is produced by intracutaneous injection of dead human tubercle bacilli. Macro- and microscopically it corresponds to the reaction of *Kveim* which is produced by an antigen prepared from sarcoid tissue.

The epithelioid cell tubercles which are specific for the disease and for the skin reaction are probably produced by products from disintegrating tubercle bacilli.

NEAL, W. J. M., WARDELL, K., BLEVINS, A., & PACIS, M. R. (1946.) **Direct culture of rheumatic virus.**—*Science*. 103. 620-621. 1750

Samples of blood plasma collected from a girl with severe rheumatic endocarditis and pericarditis were used for the inoculation of embryonated hen eggs. In one series of egg passages by

See also absts. 1755 (lymphatic system and immunity); 1779 (leucaemia); 1783 (Shope papilloma); 1790-1792 (sarcomain ducks); 1856 (influenza); 1857 (distemper and penicillin); 1879 (horse sickness); 1901-1908 (annual reports).

## IMMUNITY

HAUROWITZ, F. (1947.) **Antibodies. Their nature and formation.**—*Lancet*. 252. 149-151. [Author's summary copied *verbatim*.] 1752

Experiments made with antigens chemically labelled by the introduction of foreign tracer elements have shown that, contrary to what is the case with the natural antigens, such labelled antigens can be determined quantitatively by chemical analysis. This procedure gives us a deeper insight into the nature of antibodies. Results obtained with these artificial antigens are also valid for antibodies to natural antigens—e.g., the pathogenic bacteria. Since most bacteria contain a multiplicity of different antigens, each of them may lead to the formation of several antibodies. Our present knowledge of the nature of antibodies and their relation to antigens can be summarized as follows:

(1) Antigens are substances which disturb the normal process of protein synthesis *in vivo*, with the result that abnormal proteins are formed whose molecular surface is adapted complementarily to polar groups on the surface of the antigen molecule.

(2) If the altered proteins pass into the blood serum they act as antibodies. If they remain within the cells they are responsible for the phenomena of cellular allergy and of anaphylaxis.

(3) The combination of antibody molecules with molecules of the antigen is a consequence of their complementary structures, which enable them to approach each other so closely that the inductive forces of the mutual polar groups

the chorio-allantoic membrane route, the authors regularly found a thickened chorio-allantoic membrane with some reddening of the embryo. This finding was taken as an indication of the presence in the blood of an agent capable of being propagated in the developing hen egg.—W. M. H.

GIROUD, P. (1946.) **Démonstration faite au sujet des corps homogènes, inclusions du typhus exanthématique. [Demonstration concerning the "homogenous inclusion bodies" of typhus fever.]**—*Bull. Soc. Path. exot.* 39. 88-86. 1751

Under certain conditions "homogenous corpuscles" are found in the tissues of animals inoculated with typhus material. These bodies, according to G., are stages in the development of colonies of rickettsia: two different ways of transition from these homogenous bodies to conglomerations of rickettsia of normal morphology are described.—A. MAYR HARTING.

become effective, and strong attraction between antigen and antibody molecules results.

RODRIGUEZ LOUSTAU, J. A. (1946.) **Inmunidad contra el colera aviario. [Immunization against fowl cholera.]**—*Gac. vet., B. Aires*. 8. 66-87 & 131-166. 1753

The author studied various methods (e.g. bacteriophage, serum of immunized birds, attenuated cultures and organisms attenuated by passage through other animals or obtained from other animals) of protecting poultry against *Past. aviseptica* infection. He was never able to isolate a bacteriophage. The serum of immunized birds was effective, but that obtained from rabbits was useless. Living organisms were generally of little value and the author recommends formolized (0.5%) serum broth culture, of opacity of tube III of MacFarland's scale, in two doses of 2 ml. each, intramuscularly, with a seven days' interval. The resulting immunity was 100% protective against a lethal dose of organisms given *per os* and 66.66% protective against a lethal dose given intramuscularly; it lasted 66 days and then deteriorated, disappearing entirely on the 134th day. Phenolized serum broth culture was equally effective against infection *per os*, but only half as protective against intramuscular infection.

—R. MACGREGOR.

OLIVER-GONZÁLEZ, J. (1946.) **Immunological relationships among polysaccharides from various infectious organisms.**—*J. infect. Dis.* 79. 221-225. 1754



Polysaccharide fractions free from protein and possessing immunological properties were isolated from *Ascaris lumbricoides*, *Trichinella spiralis*, *Fasciola hepatica* and *Taenia saginata*. These showed a high degree of cross reactivity and inhibited iso-agglutinins present in human serum. When treated with A<sub>1</sub> erythrocytes or with group A blood-specific substance there was inhibition of the agglutinins in the polysaccharide antisera, but no corresponding inhibition of the precipitins, so that it is probable that the polysaccharide fractions contain more than one antigen.

A polysaccharide isolated from *Macracanthorhynchus hirudinaceus* had no cross reactivity with the foregoing, nor did it inhibit human iso-agglutinins.—J. A. NICHOLSON.

GAIDAMOVICH, S. Y., & SOLOVIEV, V. D. (1947.)

**The significance of lymph and other elements of the lymphatic system in antiviral immunity. First communication.**—*Amer. Rev. Soviet Med.* 4. 226–230. [Authors' summary slightly amended.] 1755

The metabolism between blood and cells is maintained by means of the lymph. The composition of lymph plasma is similar to that of blood plasma. The globulin content of lymph from the thoracic duct of dogs amounts to 1.54 gm. per 100 c.c., that of blood serum being equivalent to 2.65 gm.

The substances that form from the protein content of lymph may also contribute to antibody formation.

In view of the fact that antibody is linked with the globulin fraction of protein, it is to be expected that the amount of antibody in the lymph is proportional to its content of globulin. This has been confirmed with bacterial agglutinins, hemolysins, antitoxins, and by one experiment on anti-influenza antibody. Similar results were obtained in preliminary investigations on the lymph antibody level in animals immunized with other viruses, such as virus of equine encephalomyelitis and of silver fox encephalitis. The negative results regarding the content of anti-influenza antibody in the cellular elements of lymph are at variance with the theory of antibody formation in lymphocytes.

1. The amount of anti-influenza antibody in the lymph of immunized rabbits is proportional

to that in blood. The antibody titer in lymph is some 60 percent of that in blood.

2. No antibody has been found in the cellular elements of lymph.

3. When antigen is introduced into rabbits, the regional lymph nodes contain the corresponding antibody (anti-influenza) regularly although in small quantities.

SCHROEDER, C. R. (1945.) **Classification of the phenomena of specific sensitivity in lower animals.**—*J. Amer. vet. med. Ass.* 106. 351–354. 1756

Anaphylaxis, defined as specific sensitivity mediated by precipitin, is not seen in man, since in this species alone unstriped muscle is not a shock tissue. The essential shock tissue in the g. pig is bronchial muscle, in the rabbit, the media of the pulmonary artery and in the dog, the media of the hepatic vein: in anaphylactic shock, therefore, these species have symptoms of respiratory asphyxia, circulatory asphyxia and lowered systemic blood pressure due to passive congestion of the portal vein, respectively.

Allergies may be divided into five classes thus:—(a) Atopy, exemplified in human beings by hay fever, bronchial asthma and food eczema, and caused by the presence of reagin in the blood of sensitive individuals; it is of familial occurrence and may be passively conferred upon a normal individual; it is thermolabile and causes a positive skin reaction. Atopic sensitivities to pollens have been shown in dogs and in bovine animals and to ascaris antigen in dogs. (b) Contact dermatitis, caused by poison ivy, etc., and not described in animals in the natural state, but which has been induced experimentally in monkeys and g. pigs. (c) Infectious allergy, exemplified by sensitivity to cutaneous tests, such as the tuberculin test, in animals infected with the disease for which the test is made. (d) Serum disease, caused by sensitization to a foreign injected serum, and found in cattle, horses, rabbits and monkeys. (e) Familial non-reaginic allergies, in which no circulating antibody can be demonstrated and subjects give a negative skin reaction; in human beings this type is exemplified by urticaria, migraine and angioneurotic oedema. It has not been positively identified in animals; a case of milk allergy in a walrus was thought to be possibly of this type.—R. MARSHALL.

See also absts. 1699, 1706 (BCG vaccine); 1700 (antibody in colostrum); 1705 (passive transfer of sensitivity); 1711, 1712 (swineerysipelas); 1720 (strain 19 vaccine); 1733 (foot and mouth disease); 1734 (rabies vaccines); 1736 (technique of vaccination); 1741–1743 (Newcastle disease vaccines); 1790 (sarcoma in ducks); 1804 (periodic ophthalmia and allergy); 1901–1908 (annual reports).

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

I. BROWN, J. H. (1944.) **The fleas (*Siphonaptera*) of Alberta, with a list of the known**

vectors of sylvatic plague.—*Ann. ent. Soc. Amer.* 37. 207–213. 1757



II. BROWN, J. H. (1944.) **Sylvatic plague. A note on the probable relationship of flea index to epizootic plague in ground squirrels in Alberta.**—*J. Ent. Zool.* 36. 70-71. 1758  
[Absts. in *Biol. Abstr.* Sect. F. 19. No. 2. 48, slightly amended. Signed respectively C. E. ABBOTT and J. H. BROWN.]

I. The flea index of *Citellus richardsonii* should be high when the infection of animals is heavy, since fleas leave dead for living ground squirrels. The number of fleas present under such conditions is the "critical flea index." The "normal" average of fleas per animal is found to be 1.36-1.7. In plague areas the index rises to 2 or above, which must be the "critical index".

II. Sylvatic plague, the type of bubonic plague that occurs in rural areas, is present in central Alberta. It mainly affects rodents but can be readily transmitted to man, to whom it is usually fatal. The Alberta Sylvatic Plague Survey organized in 1938 under the auspices of the Department of Public Health, has been shooting and trapping small rodents in Alberta, and examining them for the presence of plague lesions; the fleas present on these rodents have also been collected, and examined for the possible presence of plague. Plague infection has been shown to be well-established in the Richardson ground squirrel (*Citellus richardsonii*) and its fleas on an area of 2,000 sq. miles in central Alberta. Particular attention was paid to collecting fleas for determination as to species. Fifty-three species are present in Alberta; of these, 11 are known plague vectors. Animal hosts and distribution of all Albertan species are recorded, but especial attention was paid to the animal hosts and distribution of the known plague vectors.

BLOCK, S. S. (1946.) **Insect tests of wire screening effectiveness.**—*Amer. J. publ. Hlth.* 36. 1279-1286. [Author's summary and conclusions copied *verbatim*.] 1759

Laboratory tests were run to determine the comparative effectiveness of different mesh sizes of window screening against flying insects. The screening tested had the nominal mesh sizes 18 × 18, 16 × 16, 14 × 14, 18 × 16, 18 × 14, and 18 × 12, although the actual mesh sizes as determined experimentally differed somewhat from the specified nominal sizes. [The numerals are the number of length wires and width wires to the inch. Diameter of the wire is not given.]

The ordinary housefly, *Musca domestica* the malaria transmitting mosquito, *Anopheles quadrimaculatus*, and the common southern house mosquito, *Culex quinquefasciatus*, were unable to penetrate any of the mesh sizes of screening tested. Both the normal sized and specially bred, undersized yellow fever mosquitoes, *Aedes aegypti*,

were able to escape from the screened test cages. For the mesh sizes of screening tested, the percentages of *Aedes aegypti* passing through the mesh openings appeared to be related to the longest dimension, the diagonal, of these openings.

The new 18 × 14 mesh screening and the standard 16 × 16 mesh screening appeared to be equal in effectiveness against *Aedes aegypti* mosquitoes. Orientation of the 18 × 14 mesh screening with the warp direction vertical and horizontal did not appear to influence the screening effectiveness. With the 18 × 12 mesh, the warp oriented in the vertical position appeared to be more effective than in the horizontal position.

No differences were encountered in the screening of male or female *Aedes aegypti*.

Outdoor screening tests against the small light-attracted insects also showed the screening effectiveness to be related to the diagonal of the individual mesh openings. For localities where small flying insects such as gnats, leaf hoppers, and sand flies are abundant or where the smaller mosquitoes such as *Aedes aegypti* and the salt marsh mosquito, *Aedes taeniorhynchus*, are prevalent, the use of 18 × 18 mesh screening is indicated.

GRAHAM, N. P. H. (1943.) **Some observations on the bionomics of the itch mite (*Psorergates ovis*) of sheep and its control, with lime-sulphur dips.**—*J. Coun. sci. indust. Res. Aust.* 16. 206-224. 1760

This mite, although only recently found, has apparently been present in Australia for many years. Symptoms caused by it have been recognized for at least 20 years and individual sheep owners recall the condition as long ago as 40 years. The mite has now been recorded from most sheep-raising areas of New South Wales and from parts of Queensland, Tasmania and Victoria. It has not yet been recorded from other than Merino sheep, but no extensive surveys of other breeds have been carried out. Infestation by lice or irritation by grass seeds produces similar symptoms.

For diagnosis of the condition it is necessary to examine fairly large amounts of material, for the mites are rarely present in large numbers. Mites have been found on all parts of the body but are more numerous on the sides. The usual practice is to examine material from four areas, each 2 inches square, on each side of the sheep. The areas are first clipped with very fine hair clippers and then smeared with a few drops of a technical white oil. The area is scraped vigorously with a scalpel and the oil and debris distributed on slides and examined, using a magnification of 60 diameters. The mites remain alive in the oil for some hours and their movements aid detection.



The rate of reproduction appears to be very slow. Transmission took place readily from machine-shorn sheep to other shorn or unshorn sheep. Transmission from unshorn sheep was much slower and contact for some months was necessary.

Solutions containing 0.2% arsenic trioxide and suspensions containing 0.005% rotenone killed a high proportion of mites. Solutions of lime-sulphur containing 0.4% or more weight/volume of polysulphide sulphur usually destroyed all mites. For field use, a lime-sulphur dip containing 1% weight/volume polysulphide sulphur and 0.03% weight/volume of a wetting agent "Agral 3" was used and a single dipping appeared to result in eradication of the mite.—H. McL. G.

UNSWORTH, K. (1946.) **Studies on the clinical and parasitological aspects of canine demodectic mange.**—*J. comp. Path.* 56. 114–127. 1761

A quantitative method of assessing the number of mites present in lesions has been evolved. Weighted amounts of skin are macerated in caustic potash solution and the parasites counted in the centrifuged deposit. This procedure was applied to obvious lesions, to skin removed from the predilection sites of apparently normal animals and to the submaxillary, retropharyngeal, pre-scapular, inguinal popliteal, mediastinal and

See also absts. 1731 (transmitting fowl malaria); 1880 (sheep dips).

#### PARASITES IN RELATION TO DISEASE [HELMINTHS]

MARKWARDT. (1943.) Ueber das Vorkommen der lebenden und abgestorbenen Rinderfinne in Kaumuskul, Zunge und Muskulatur unter besonderer Berücksichtigung der Herzmuskulatur. [Occurrence of live and dead bovine cysticerci in the masticatory muscles, tongue and musculature with special reference to the heart.]—*Z. Veterinärk.* 55. 68–69. 1762

The high percentage (approximately 13%) of cysticerci-infested animals found in an abattoir in the Ukraine led to the investigation of the occurrence of bovine cysticerci here described.

In the 200 cases examined by M. in the summer of 1942, cysticerci were present in approximately equal proportion in the masticatory and heart muscles. Official regulations prescribe two longitudinal cuts across the heart but M. found that sometimes as many as six cuts were necessary before cysticerci could be brought to light. In 79 cases there were cysticerci in the heart, 21 of which were alive. Cysticerci were found in 4% of cases in the tongue and in 2.5% in the musculature; occurrence in neck muscles was rare. In four cases cysticerci were found both dead and alive.—E. CHERKESI.

WATSON, J. M. (1946.) **Helminths infective to**

mesenteric glands. Clinically affected dogs supported several thousand per 0.1 g. of skin removed from lesions, while about 10% of clinically normal dogs held numbers generally less than 50 in the same weight of skin from similar sites. One apparently normal dog held a very high population of over 1,000 per 0.1 g. without detection of any abnormality.

From approximately 12% of affected animals the mites were demonstrated in the submaxillary, pre-scapular internal iliac, portal or mesenteric lymph nodes. 2% of clinically normal animals supported mites in the submaxillary, but no mites were found in the nodes of the dogs in which no mites could be demonstrated by skin examination. Although different instars were present it was not considered that there was evidence of reproduction in the glands.

The parasites were transmitted by transference to marked areas of the skin of puppies. In some they reproduced but no clinical disease was evoked.

The disease is commonest in short-coated dogs under one year with predilection for head sites with squamous lesions. Pustular disease was noted in 14% of cases [all in long-haired dogs] in association with *Staph. albus* in pure culture or with *Staph. aureus*.—T. SPENCE.

man in the Syrian hamster.—*Brit. med. J.* Oct. 19th. 578. 1763

The examination P.M. of 160 Syrian hamsters (*Cricetus auratus*) imported as laboratory animals, revealed the presence of *Hymenolepis nana* and *Syphacia obvelata*. *Hymenolepis nana*, the dwarf tapeworm, was found in 19 (11.9%) hamsters. This tapeworm is directly infective to man, requiring no intermediate host, and once an infestation is acquired it may become serious through internal auto-infection. *Syphacia obvelata* was discovered in 83 (51%) hamsters. This species of oxyurid nematode is also believed to be infective to man.

As a precautionary measure, personnel handling the animals were examined for signs of infestation by either helminth. All tests were negative and W. concludes that in practice there appears to be no serious risk of infection to man.

—D. W. JOLLY.

GRINBLAT, S. (1945.) Estudio sobre el valor de la reacción de Casoni complementada con la prueba de Michailow para el diagnóstico de la equinococcosis. [Value of the Casoni reaction and of Michailow's test in hydatid disease.]—*Rev. Assoc. méd. argent.* 59. 17–26. [English,



French and German summaries, p. 25.] [Abst. in *Helminth. Abstr.* 14. 16, copied *verbatim*.] 1764

Grinblat has investigated the use of the Casoni reaction and Michailow's test in the diagnosis of hydatid disease. Using titrated antigens, both tests were 100% accurate. Using hydatid fluid however both gave some doubtful results in both experimental and control groups, and positive results also occurred in patients suffering from other diseases. In all groups of patients, there were a larger number of positive results with the immediate action than with the delayed action.

COLE, G. (1945.) **Hydatid disease in Victoria.**—*Hlth Bull., Melbourne.* Nos. 81-82. pp. 2178-2188. 1765

A large amount of statistical data is tabulated, covering the geographical distribution of the disease in man in Victoria, the cases notified and deaths registered, age and sex distribution and the sites of lesions.

Data on the incidence of hydatid cysts in the viscera of sheep and cattle in certain regions is presented (up to 71% of livers and lungs were infested). The incidence of the adult parasite in dogs is discussed and data collected by CLUNIES ROSS (1926) is repeated: this showed that 40% of dogs on sheep farms and 25% of dogs at slaughter yards and small country centres were infested. C. found that 25% of 35 dogs in a dairying district were infested.

The stages in the life-cycle of *Echinococcus granulosus* are discussed briefly, and in addenda are given (a) the method of carrying out a survey of the incidence of *E. granulosus* in dogs and (b) notes on prevention of hydatid disease in districts with a high incidence of human cases.

—H. McL. GORDON.

CECCARELLI, A. (1946.) La ricerca della urobilina nella echinococcosi epatica dei bovini. [Testing for urobilin in echinococcosis of the bovine liver.]—*Clin. vet., Milano.* 69. 129-132. 1766

C. carried out qualitative and quantitative examinations of urine from ten healthy cattle and from ten cattle lightly infested with parasitic liver cysts. Urobilin was either reduced in quantity or absent in the cattle affected with echinococcosis, the only exception being a pregnant animal. Urinary urobilin is known to be increased in pregnancy in the bovine.—I. W. JENNINGS.

HUMMELINCK, P. W. (1946.) Onderzoekingen over de eieren van paardenstrongyliden. [Investigation of the eggs of horse strongyles.]—*Tijdschr. Diergeneesk.* 71. 411-427. [English, French and German summaries. Abst.

from English summary.] 1767

Differentiation between the eggs of species and even genera of horse strongylids is almost impossible. Eggs are deposited in the caecum and colon and quickly reach the seven celled stage. Lack of oxygen prevents the eggs from hatching in the host's intestines, although in exceptional cases more developed embryonal stages may be observed.

OTTAWAY, C. W., & BINGHAM, M. L. (1946.) Further observations on the incidence of parasitic aneurysm in the horse.—*Vet. Rec.* 58. 155-159. [See also *V. B.* 15. 15.] 1768

The authors examined 87 ponies for evidence of infestation with *Strongylus vulgaris* and paid special attention to the location of parasitic aneurysms, the most common sites of which were the root and origin of the main divisions of the anterior mesenteric artery, although lesions also occurred in the coeliac axis root and its branches, the renal arteries and the aorta. Figures given in a semi-diagrammatic drawing show the incidence of the aneurysms. Little correlation was found between the physical condition of the animals, egg counts, eosinophilia and the presence of aneurysms and the comparison of such findings is considered to be of little value for diagnostic purposes. Evidence was obtained to suggest an intra-arterial migration of larvae, possibly associated with part of the life cycle of the strongyle. The number of larvae was found to be greatest in aneurysms from ponies in the younger age groups, although the size of the aneurysm apparently bore no relationship to the number of larvae contained therein. There was also some evidence in favour of the view that verminous colic may be due to nerve lesions in the peritoneal ganglia produced by pressure of proximate aneurysms. The association of iliac thrombosis with the presence of *S. vulgaris* larvae is discussed.—J. N. OLDHAM.

SARWAR, M. M. (1945.) Incidence of some nematodes of domestic ruminants in the Punjab and United Provinces, with a note on the morphology of *Trichuris globulosa* (v. Linstow).—*Proc. Indian Acad. Sci. Sect. B.* 22. 274-278. [Abst. in *Helminth. Abstr.* 14. 80, copied *verbatim*.] 1769

Sarwar records for the first time in India the presence of *Trichostrongylus probolurus*, *T. axei*, *Ostertagia ostertagi*, *O. mentulata*, and *Trichuris globulosa* in goats; *T. globulosa*, *Cooperia punctata*, *C. pectinata*, and *O. mentulata* in sheep; *O. mentulata* in *Gazella bennettii*; and *T. colubriformis* in cattle. He comments on the irregular and erratic distribution of certain helminths, e.g. *T. probolurus* is common in the Punjab but does not seem to occur at all at Izatnager. He considers



that *Trichuris globulosa* is distinct from *T. ovis* and describes its internal genitalia, pointing out distinguishing characters.

SARWAR, M. M. (1945.) **Two new records and a new species of the genus *Trichuris* from domestic ruminants.**—*Curr. Sci.* 14. 306-307. [Abst. in *Helminth. Abstr.* 14. 67, copied *verbatim*.] 1770

Sarwar records the presence of *Ostertagia pinnata* from sheep in Mukteswar, and *O. grühneri* from cattle also in Mukteswar. *Trichuris ovina* n.sp. described from sheep and goats in the Punjab and United Provinces resembles *T. parvispiculum* and *T. discolor* but can be distinguished by the truncated end of the spicule, the shape of the sheath, and by the distribution of the spines.

KUITUNEN-EKBAUM, E., & WEBSTER, D. (1947.) **Trichinosis in wild rats in Toronto.**—*Canad. J. publ. Hlth.* 38. 76-78. 1771

This report deals with the examination of 650 rats (*Rattus norvegicus*) caught in abattoirs, office buildings, warehouses, restaurants, etc., in the city of Toronto. Examinations were made by direct and digestion methods. Nine rats (1.4%) were found to be infected with encysted larvae of *T. spiralis*.—THOS. MOORE.

CROFTON, H. D. (1947.) **The second ecdysis of *Trichostrongylus retortaeformis* (Zeder).**—*Parasitology.* 38. 101-103. 1772

C. tested the effect of saliva, different concentrations of HCl, HCl and pepsin, and HCl and boiled pepsin on the exsheathment of infective *Trichostrongylus retortaeformis* larvae. In saliva, no ecdyses occurred, but the larval sheaths became thinned and swollen at the anterior end. In HCl, diluted to give a pH ranging from below 1 to 7, sheaths were dissolved when the pH was 1 or below, while at pH 2-3 sheaths did not dissolve but their surface became "sticky". In HCl diluted to give a pH ranging from 1.1 to 7.0 and to which pepsin solution was added to give a final pepsin concentration of 0.2%, a high percentage of moults occurred at pH 1.1-5.1. Boiled pepsin and HCl did not induce exsheathment. It was observed that exsheathment occurred by the loss of the anterior cap and that the ecdysis was completed in most of the larvae after 60 hours. Ecdysis was induced by the pepsin, possibly as the result of its proteolytic action, within the pH range 4-5, which was the most favourable both for ecdysis and survival of the larvae. This pH range is within that quoted for the stomach contents of rabbits.—J. N. OLDHAM.

VELU, H., & ZOTTNER, G. (1942.) **Chéloïdes géantes consécutives à l'habronémose cutanée chez le Baudet. [Tumour formation as a**

**sequel to skin lesions caused by *Habronema* larvae in horses.]**—*Rec. Méd. vét.* 118. 18-19. 1773

Habronemic summer sores are common in jackasses in Morocco. They usually persist in winter in the form of hard swellings and have a tendency to recur after surgical intervention. No metastases, however, are produced. Histologically their structure is that of keloids.—J. N. OLDHAM.

BAUMANN, R. (1946.) **Beobachtungen beim parasitären Sommerbluten der Pferde. ["Summer bleeding" in horses caused by *Parafilaria multipapillosa*.]**—*Wien. tierärztl. Mschr.* 33. 52-55. [English, French and Russian summaries.] 1774

B. notes that the females of *Parafilaria multipapillosa*, which inhabit the subcutaneous and intermuscular connective tissue of equines and cause the troublesome affection known as parasitic dermatorrhagia or "summer bleeding", pierce the host's skin to deposit their eggs. On the local haemorrhages so produced swarms of muscid flies collect to suck the escaping blood and thus ingest the embryonated eggs or hatched larvae of the nematode, for which they act as intermediate hosts. Microfilariasis of the blood does not occur and B. considers that microfilariae found by observers in the haemorrhages are those of filarid worms other than *Parafilaria* concurrently present.

—J. N. OLDHAM.

ACKERT, J. E., BRANSON, D. S., & AMEEL, D. J. (1944-45.) **Effect of an all plant ration on the resistance of an omnivorous animal to parasitism.**—*Trans. Kans. Acad. Sci.* 47. 215-218. 1775

In view of reports that a heavy meat diet was unfavourable for parasitic worms and the conclusion reached by ACKERT *et al.* (1931) that the natural resistance of chickens to ascarids was lowered by a deficiency of vitamin A, tests were carried out in which three groups of chickens from the same hatch were parasitized with the same number of ascarid eggs and given basal cereal diets, with three different protein supplements.

Resistance to nematodes was found to be highest in a group receiving a meat and milk supplement and lowest in a group with only a peanut supplement. In another experiment chicks supplemented with soya bean oil meal had as much resistance as those with a meat and milk supplement: this was attributed to the digestibility of the former.—S. M. G.

SILVA LEITÃO, J. L. (1945.) **Parasitoses animais. [Helminthiasis in domestic animals.]**—*Rev. Méd. vet., Lisboa.* 40. 15-24. 1776

The author draws attention to the great losses caused by parasitism in slaughter animals in



Portugal. During the year 1942, 44,189 animals were partly condemned in the country's abattoirs for fascioliasis, 13,550 for fascioliasis associated

See also absts. 1754 (immunity); 1784 (sarcoma caused by larval tapeworms); 1858-1860 (anthelmintics); 1876 (in game animals); 1901-1908 (annual reports).

## SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

PIRES, R. E. (1945.) Tumores renais em bovino. [Renal tumours in the bovine.]-*Rev. Fac. Med. vet. S. Paulo*. 3. 137-146. [English summary slightly amended.] 1777

Two renal tumours are described, both of which originated from renal blastema. One of the tumours was benign, with nephrogenous, fibrous and muscular tissue, and the other was malignant, consisting of sarcomatous tissue, with smooth muscular fibres and epithelial-like cells.

PIRES, R. E. (1945.) Melanoma primário do palato mole de um cão. [Primary melanoma of the soft palate of a dog.]-*Rev. Fac. Med. vet. S. Paulo*. 3. 131-136. [Abst. from English summary.] 1778

P. describes a case of melanosarcoma of the soft palate of a dog, which had progressive signs of dyspnoea and dysphagia and died a month later. P.M., the tumour was found to cause an obstruction of the pharynx.

THIERSCH, J. B. (1946.) Attempted transmission of acute leukemia from man to man by the sternal marrow route.-*Cancer Res.* 6. 695-698. [Author's summary copied *verbatim*.] 1779

Acute untreated human leukemia could not be transmitted with cellular sternal marrow by the sternal marrow route from man to man. No further evidence to separate acute and chronic leukemia, in spite of their clinical difference, could be brought forward. No evidence of a transmissible virus as cause of acute leukemia in man was detected.

ROBAK, H. (1944.) Det biologiske grunnlag for dannelsen av ondartete svulster hos planter og dyr. [The biological basis for the formation of malignant growths in plants and animals.]-*Naturen*. 2. 41-57. 1780

This is a general discussion of work done from 1915-42 on the biology and biochemistry of tumour formation in the plant and animal kingdoms, dealing mostly with the former; Carcinogenic substances are considered. There is no new material.

HESTON, W. E. (1944.) Role of heredity in tumor development.-*J. nat. Cancer Inst.* 5. 161-171. 1781

This is a lengthy discussion aimed at clarifying the position of the genetic factors in the development of cancer. Various basic concepts

such as relationship of the gene to the cancer character, multiple factor inheritance and dominance are discussed.-A. R. JENNINGS.

HARRIS, P. N. (1947.) On the production of sarcoma with wheat germ oil.-*Cancer Res.* 7. 26-34. [Author's summary copied *verbatim*.] 1782

Despite prolonged oral administration of large amounts of ether-extracted wheat germ oil to rats, no tumors were obtained.

Repeated subcutaneous or intraperitoneal injections of the oil into mice and rats resulted in development of sarcomas in 2 mice and 16 rats. The tumor incidence was only 8 per cent in rats and 5 per cent in mice.

The production of these tumors is considered to be a non-specific reaction to chronic irritation.

COMAN, D. R. (1946.) Induction of neoplasia *in vitro* with a virus. Experiments with rabbit skin grown in tissue culture and treated with Shope papilloma virus.-*Cancer Res.* 6. 602-607. [Author's summary and conclusions copied *verbatim*.] 1783

Experiments were designed to determine whether neoplasia can be induced in tissue cultures of rabbit skin by papilloma virus.

The criteria adopted for induction of neoplasia were: a. Increased growth activity of epithelial cells in the cultures after introducing papilloma virus. b. Formation of relatively large tumors in the liver of the rabbit following implantation of such tissue cultures.

Both criteria were met by the experiments and it is therefore concluded that papilloma virus is capable of inducing neoplasia *in vitro*, namely in tissue cultures of rabbit skin.

DUNNING, W. F., & CURTIS, M. R. (1946.) Multiple peritoneal sarcoma in rats from intraperitoneal injection of washed, ground *Taenia* larvae.-*Cancer Res.* 6. 668-670. [Authors' summary and conclusions copied *verbatim*.] 1784

There appears to be an active agent present in washed, ground *Taenia* larvae which is capable of initiating multiple peritoneal sarcomata when injected into the peritoneal cavities of rats. The agent is either more effective or else more abundant in parasites obtained from uninvolved cysts of hosts bearing induced *Cysticercus* sarcomas. Rats



of the same inbred line as the host from which the parasites are obtained respond more quickly and more frequently than unrelated rats. The active agent appears to be associated with the calcium carbonate corpuscles of the parasite.

HOCH-LIGETI, C. (1947.) **Changes in the succinoxidase activity of livers from rats during the development of hepatic tumors on feeding *p*-dimethylaminoazobenzene.**—*Cancer Res.* 7. 148-157. [Author's summary copied *verbatim*.] 1785

The succinoxidase activity of rat liver slices and homogenates was studied during the course of development of hepatic tumors due to feeding of *p*-dimethylaminoazobenzene. The diets of the animals consisted of rice and carrot, rice, casein and carrot, rice and milk, or a semisynthetic diet containing a high percentage of fat.

The succinoxidase activity of the homogenates of livers from the rats not receiving *p*-dimethylaminoazobenzene varied slightly with the diet; it was lowest with the high-fat diet and highest with the rice diet containing 6 per cent casein, where the percentage of fat was lowest.

After the addition of Na succinate the O<sub>2</sub> uptake of homogenates of liver, with and without excess of cytochrome *c*, from rats receiving *p*-dimethylaminoazobenzene was only slightly lower than the control irrespective of whether the individual animal had developed a hepatic tumor or not. The tumors themselves showed generally a low succinoxidase activity.

Slices of liver from animals subsequently developing tumors on *p*-dimethylaminoazobenzene had lower succinoxidase activity than the controls. The succinoxidase activity was further depressed on the development of tumors and was very low in tumor tissue.

In one series of rats where the addition of milk largely prevented the development of hepatic tumors the succinoxidase activity of liver slices did not differ from that in rats on the control diet.

The addition of azobenzene to a rice-carrot diet had no effect on the succinoxidase activity of the homogenates or slices of livers.

The discrepancy between the values for succinoxidase found when using homogenates, or slices of the same liver from animals fed *p*-dimethylaminoazobenzene might be explained by a different accessibility of the parts of the enzymic system or by assuming an intracellular inhibition in these livers.

BURKOWS, H., & HOCH-LIGETI, C. (1946.) **Effect of progesterone on the development of mammary cancer in C3H mice.**—*Cancer Res.* 6. 608-609. [Authors' summary copied *verbatim*.] 1786

Thirty mice of a high mammary cancer strain (C3H) received subcutaneous injections of 1 mgm. of progesterone weekly. No differences could be established in the frequency and the age of the appearance of tumors in these mice and in the 20 control animals receiving injections of the solvent only.

KAPLAN, H. S. (1947.) **Observations on radiation-induced lymphoid tumors of mice.**—*Cancer Res.* 7. 141-147. [Author's summary copied *verbatim*.] 1787

Strain A mice in groups of various ages yielded a maximum incidence of lymphoid tumors in animals irradiated at 1 month of age with a sharp decrease at 2 months and later.

Thymectomy of strain A mice irradiated at 2 to 3 months of age resulted in a considerable increase in the latent period and a very slight decrease in the incidence of lymphomas as compared with the low incidence in intact irradiated control mice of the same age. In a parallel experiment, splenectomy was followed by a slight decrease in incidence without change in latent period.

The tumors are lymphocytic lymphomas which, in most instances, appear to arise in the thymus, to disseminate to the spleen, lungs, liver, kidneys, and lymph nodes, and to cause leukemia in a considerable percentage of animals.

Incidental observations on radiation-induced ovarian tumors and on inhibition of spontaneous mammary tumors following x-ray treatment are presented.

WOOLLEY, G. W., & LITTLE, C. C. (1946.) **Transplantation of an adrenal cortical carcinoma.**—*Cancer Res.* 6. 712-717. [Authors' summary copied *verbatim*.] 1788

An adrenal cortical tumor, P1699, arising in a gonadectomized female ce strain mouse has been grown successfully in the following classes of ce mice: (a) gonadectomized females, (b) gonadectomized males, (c) intact females and (d) intact males. It was also grown in two F<sub>1</sub> generation mice where a ce mouse was one of the parents. Evidence was secured that the transplant tumors were associated with an androgenic influence in most instances although under some circumstances there was evidence for an estrogenic influence. Transplants of adrenal tumor P1699 exerted a restraining effect on the occurrence of primary adrenal cortical tumors.

HEISDORF, A. J., BREWER, N. R., & LAMOREUX, W. F. (1947.) **The genetic relationship between mortality from induced and spontaneous lymphomatosis.**—*Poult. Sci.* 26. 67-73. 1789

Poultry breeders have endeavoured to increase



resistance to lymphomatosis by hatching chicks from families which seem to be relatively resistant to the disease. In the absence of a high incidence of infection in the flock, it is difficult to identify accurately families having the greatest resistance.

Experiments showed that the incidence of lymphomatosis following subcutaneous inoculation with lymphomatous tissues in lines of chickens which had been bred for resistance or susceptibility to lymphomatosis was not significantly different. However, when lymphomatous material was placed in the mouth, eye and nostril, a significant difference between the two lines appeared. The authors consider that "oral" dosage with lymphomatous material is a promising method for increasing the incidence of lymphomatosis to make selection for resistance against the disease more effective.—F. D. ASPLIN.

DURAN-REYNALS, F., & KING, J. W. (1947.) **Reciprocal effects of natural immune bodies from chickens and ducks on variants of a sarcoma virus.**—*Cancer Res.* 7. 21-25. [Authors' summary copied *verbatim*.] 1790

The immune bodies that develop naturally in the blood of aging chickens neutralize the viruses of both the chicken tumor (Rous sarcoma) and its duck variants as tested on both chickens and ducks. Therefore, the resistance of chickens against these viruses is linked with the presence of humoral factors and might be explained on this basis.

On the contrary, comparable immune bodies from aging ducks neutralize only duck tumor viruses as tested on ducks, but not as tested on chickens; nor do they neutralize chicken tumor viruses as tested on either chickens or ducks. Therefore, the refractory state of ducks against heterologous chicken viruses, solidly installed very shortly after hatching, cannot be linked with humoral factors but rather belongs to the so-called species resistance. However, the resistance of these hosts against the virus after it has varied and has become a duck virus is linked with humoral factors and might be explained on this basis. One may add that, with the tumor viruses here studied, the species resistance is far more effective than the humoral resistance, and that the presence of natural specific immune bodies against the viruses

is an indication of actual or potential susceptibility to these viruses.

Analysis of the 8 possible sequences that can be obtained by testing the effect of chicken and duck sera against homologous and heterologous tumor viruses on homologous and heterologous hosts indicates that a pronounced antigenic change has taken place in the virus in the process of variation, and tentatively one may form an idea of the nature of this change.

I. DURAN-REYNALS, F. (1947.) **A study of three new duck variants of the Rous chicken sarcoma.**—*Cancer Res.* 7. 99-102. 1791

II. DURAN-REYNALS, F. (1947.) **Transmission to adult pigeons of several variants of the Rous sarcoma of chickens.**—*Ibid.* 103-106. 1792  
[Author's summaries copied *verbatim*.]

I. Three new variants in ducks of the Rous sarcoma of chickens were obtained. Because they showed characteristics different from those of the variants previously studied, the strains are described in some detail. The most important difference was that the viruses of the strains here studied, despite becoming adapted to ducks, did not lose their affinity for their original host, the chicken. Also, the tissue affinities of the viruses, the amount of collagen in the tumors, and the reaction of bones of chicks to periosteal and endosteal tumors were different. The virus of one of the variants, strain 14(d)7, was of special interest for the following reasons: first, because after infecting adult chickens it lost its acquired affinity for ducks and reverted to a chicken tumor type; second, because it induced malignant tumors in pigeons of all ages; and third, because it showed an affinity for the central nervous system of young ducks.

II. Suspensions of tumor cells of 2 duck variants of the Rous sarcoma and another duck tumor of uncertain origin injected into the breast of pigeons several months old induced local growths never followed by generalization, while tumor cells from another variant induced even in pigeons 12 months old large local growths often followed by generalized metastases and causing death of the host in a few weeks. These tumors have been maintained in 2 or 3 successive passages through pigeons.

See also *absts.* 1773 (habronemic tumours of the skin).

## DISEASES [NON-INFECTIVE] OF BREEDING STOCK

NEVES E CASTRO, A. V. (1941.) **Les problèmes de la fécondation artificielle de la jument. [Problems of artificial insemination in the mare.]**—*Rev. Med. vet., Lisboa.* 36. 106-110. [In French.] 1793

It is pointed out that artificial insemination

is not yet as satisfactory in the mare as in the cow and ewe because in the case of the mare it is difficult to determine the exact time to inseminate and because the methods of collecting equine semen do not allow it to be obtained in the pure state indispensable to keeping it alive. How to



overcome both the above difficulties is described and it is claimed that equine semen collected by means of a special artificial vagina, diluted with Ringer's solution, and frequently shaken during storage, can be kept for 30–36 hours at a temperature of 25°–30°C.

The author gives details of what he has found to be the most suitable times, the intervals and frequency with which insemination should be carried out.

It is suggested that lack of orgasm when artificial insemination is used militates against the success of the method. Methods of producing orgasm are described.—J. S. S. INGLIS.

WILLIAMS, P. C. (1945.) **Studies of the biological action of serum gonadotrophin. I. Decline in ovarian response after hypophysectomy.**—*J. Endocrinol.* 4, 127–130. 1794

A single injection of 20 I.U. of semen gonadotropin was given to immature rats from four days before to 14 days after hypophysectomy and the animals were killed five days after the injection. A basal condition of ovarian responsiveness was attained two days after hypophysectomy. Ovulation occurred in rats injected up to four days after the operation, but not in the rats injected later.—J. M. ROBSON.

PFEIFFER, C. A. (1942.) **Interstitial cell stimulation and luteinization under the influence of male and female hypophyses.**—*Yale J. Biol. Med.* 14, 619–630. 1795

Recent investigation into the chemistry of the gonadotropins have indicated that luteinizing hormone (LH) and interstitial cell stimulating hormone (ICSH) are identical. The present study is an attempt to provide an explanation of the maintenance of interstitial cells and the absence of luteinization noted by several investigators in experiments on parabiosis and which suggests that the LH and ICSH are not the same. From the results of experiments involving the use of constant-oestrous rats and ovarian grafts from these rats, P. suggests that the interstitial cells respond to a lower level of LH or ICSH, probably in combination with follicle-stimulating hormone (FSH), than that required for luteinization. The ability to secrete LH at the luteinizing level is apparently an exclusive function of the female hypophysis.—ALFRED T. COWIE.

ZONDEK, B. (1947.) **Placental hormones after death of foetus with viable placenta.**—*Lancet* 252, 178–179. [Author's summary copied verbatim.] 1796

A placenta can sometimes remain functional despite death of the foetus and can then continue to produce hormones in a normal way for several weeks after the foetus has died.

In such cases the hormone levels in blood and urine can be higher than in normal pregnancy, because the entire output of placental hormones is taken up by the maternal circulation, none going to the foetus.

These observations indicate that death of the foetus may be either primary—i.e., independent of the placenta—or secondary, due to death of the placenta.

Whereas in secondary death of the foetus the hormone levels in blood and urine fall rapidly, in primary death of the foetus there is no such immediate fall and the levels may even rise temporarily.

GUNN, R. M. C. (1942.) **Reproductive hormones: Their application in veterinary practice.**—*Aust. vet. J.* 18, 13–18. 1797

G. reviews the uses to which existing knowledge of the various sex hormones has been put in veterinary practice. Consideration is given to the diagnosis of pregnancy and cryptorchidism, the induction of oestrus and ovulation, the treatment of reproductive disorders and the mode of administration of these hormones. A warning is sounded against the thoughtless use of such highly active substances.—C. R. AUSTIN.

GRASHUIS, J., & DE MAN, T. J. (1945.) **Over de mogelijke deinvloeding van de leg bij kippen door geslachtshormonen en plantengroeistoffen. [Effect of sex hormones on egg production in fowls.]**—*Tijdschr. Diergeneesk.* 70, 334–348. [English summary.] 1798

The authors review briefly 15 references dealing with the influence of sex-hormones on egg production and study the influence of sex hormones and auxines on the production of eggs in hens in full lay.

The experiment is recorded in detail and gives the chemical composition of the basal ration fed to the birds. They were divided into eight groups of 18 each and the sex hormones and auxines were administered as follows:—group 6 A, control group; group 6 B, gestyl [a pregnant mare's serum preparation] injections; group 8 A, auxines; group 8 B, auxines plus gestyl injections; group 9 A, methyl testosterone; group 9 B, methyl testosterone plus gestyl injections; group 11 A, auxines plus methyl testosterone; 11 B, auxines plus methyl testosterone plus gestyl injections. The auxines and methyl testosterone were fed with the ration.

The control group laid best (862 eggs). The addition of auxines and methyl testosterone did not stimulate egg production. The number of eggs produced were 722, 700 and 666 in groups 8 A, 9 A and 11 A respectively. Gestyl injections resulted in a decreased egg production, the pro-



duction of eggs being 523 (6 B), 415 (8 B), 321 (9 B) and 410 (11 B). These injections increased markedly the non-laying periods.—P. L. LE ROUX.

DELORY, G. E. (1947.) **Seminal fluid acid phosphatase in sterility.**—*Brit. med. J.* April 26th. 566–567. 1799

The presence of acid phosphatase in seminal fluid and the prostate gland has given rise to much speculation as to the function of the enzyme since it is not present before puberty.

Examination of semen from 36 males undergoing treatment for sterility failed to reveal any correlation between the number or motility of the spermatozoa and the amount of enzyme present. The lowest value found was 244 units per ml. of semen and the highest 7,000 units per ml.; in both cases motility was absent. On the other hand, semen with 90–95% motility had an enzyme value of between 1,000 and 2,000 units per ml. The lowest value found was sufficient for carbohydrate metabolism to continue at a normal rate, so that the function of the enzyme is still obscure.

—J. A. NICHOLSON.

TEUNISSEN, G. H. B. (1941.) *Endemisch optredende sterilitet bij het rund.* [Endemic sterility in cattle.]—*Tijdschr. Diergeneesk.* 68. 873–885 & 886. [English, French and German summaries.] 1800

T. notes that by sterility is usually meant the return of the cow to the bull in 3 to 6, sometimes 9, weeks after service. This form of sterility occurs endemically and all the animals, or a large percentage, in a herd may be affected. During the years 1938–39 and until September, 1940, they treated 162, 217 and 90 animals for endemic sterility in the neighbourhood of Utrecht. Sterility was most prevalent in animals that had calved once previously and infection of the uterus appeared to take place after the first parturition. An abnormal parturition did not seem to be a contributory factor.

A widespread outbreak of brucellosis in a herd is followed by cases of vaginal discharge and sterility, but there are no indications that brucellosis plays a part when once this disease has passed through the herd. Abnormalities in the ovaries

See also *absts.* 1781 (heredity and cancer); 1839 (oestrus in sheep).

seem to be insignificant, but inflammatory conditions of the uterus, and to a less degree of the vagina, are important factors. Cervicitis is often accompanied by a vaginitis.

About 62% of cases treated with an aqueous solution of iodine in KI solution according to the method of Albrechtsen became pregnant and gestation was normal. This treatment was unfavourably affected by ovarian abnormalities. *Trichomonas* infection, which is not prevalent in the area, was treated successfully by irrigation of the uterus and vagina with aqueous solution of iodine in KI solution and its spread controlled by artificial insemination.—P. L. LE ROUX.

DANFORTH, C. H. (1947.) **Morphology of the feet in polydactyl cats.**—*Amer. J. Anat.* 80. 143–171. [Author's summary copied *verbatim.*] 1801

Polydactyly in the cat, a trait induced by a single dominant gene, reveals a considerable range of expression with respect to the number and size of extra digits, and the structures related to them. The variations, some of which appear as if they were qualitative, are believed to be the discontinuous structural expressions of quantitative differences in the effect of organizing factors acting on an excess amount of digitogenic tissue on the pre-axial side of the limb bud. It is suspected that inducing this excess tissue may be the only direct function of the causative gene.

Regulation of differentiation in the limb bud is to some extent from the periphery inward, and by no means entirely centrifugal. The peripheral alterations which occur in polydactyly affect the organogenesis of most types of tissue in the distal part of the limb. Muscle tendons, for example, divide to reach new cartilages, and in turn split the muscles from which they arise. In this way "new" muscles, analogous to those in other species may be brought into existence.

The manifestation of polydactyly at times gives a spurious appearance of reversion but some of the classical concepts of homology seem to be misleading, or of little value, for purposes of interpreting polydactyly and probably normal conditions as well.

## DISEASES, GENERAL

EUGSTER, J. (1944.) *Geographische pathologie.* [Medical geography.]—*Schweiz. Arch. Tierheilk.* 86. 217–224. 1802

Medical geography deals with (a) the distribution of disease in various countries and (b) the influence of climate and other factors on the manifestations of a disease in different parts of the world.

Examples from human medicine are given. For example, appendicitis, gastric ulcer and cancer of the stomach are said not to occur in Malays living on a vegetarian diet, while they are common in meat-eating Chinese living in Malaya. In Malaya, typical pneumonia does not occur, only atypical "soft" pneumonias being seen.



Other diseases such as arteriosclerosis do not appear to vary from one country to another.

—C. AHARONI.

REDDIN, L., Jr., & STEVER, D. W. (1946.)  
**Allergic contact dermatitis in the horse.**—*N. Amer. Vet.* 27. 561-563. 1803

A transient reaction occurred in a hunter, in which the skin of the neck and shoulders became thickened and devoid of hair. Skin tests with suspected materials revealed that a typical large reaction occurred when a pigmented leather soap and a leather conditioner were applied together, but not when they were tested separately. The ingredients of these preparations, which when mixed on the surface of the skin gave rise to the dermatitis, were wool yellow dye and sulphonated neat's foot oil. Avoidance of the allergic materials brought about recovery. Practical hints are given for detecting sensitizing agents in animals by means of skin tests.—J. KEPPIE.

CÁMPORI, A. S., HARISPE, C., ECKELL, O. A., ORLIACQ C., & GONZÁLEZ, B. (1944.) *Oftalmia periódica*. [**Periodic ophthalmia.**] pp. 55. Buenos Aires: Ejército Argentino, Dirección de Remonta. 8vo. [English and Portuguese summaries.] [Reprinted from *Circulo Militar*. Oct. 1st. (1948).] 1804

From their observations and experiments on periodic ophthalmia the authors reach the following conclusions:—

The condition comes within the general description of anaphylaxis, comporting a local anaphylaxis dependent upon a general state of hypersensitivity. The general, or systemic state of hypersensitivity is apparently brought about by the albumens of chick embryos and cattle serum, acting as antigens. Once the general state of hypersensitivity is produced, the local anaphylaxis can be produced by suitable proteins. These proteins are found in peptone and in fresh manure.

In the cases studied by the authors the mechanism of the condition appears to be as follows:—A suitable systemic state of hypersensitivity is produced by the injection of material containing albumen of chick embryo or bovine serum. Later, a sensitizing dose of protein from fresh manure entering the eye produces a state of local hypersensitivity. The anaphylactic state is produced by a later and larger dose of the same protein. It appears that an animal may become desensitized spontaneously and the authors hope to be able to produce this therapeutically.

—MILLER WATSON.

WYSSMANN, E. (1944.) *Nasenbluten beim Rind*. [**Epistaxis in cattle.**]—*Schweiz. Arch. Tierheilk.* 86. 112-119. 1805

This relatively rare syndrome was encount-

ered 18 times during 30 years of practice, being caused mostly by trauma, but also by foreign bodies, parasites and tumours; it may occur also in heart, lung and infectious diseases, in vitamin C deficiency, in mercury poisoning and in haemophilia. Five interesting cases are described in detail.

In persistent cases, bleeding may continue for 7-21 days; it may cause severe anaemia, reduced or even completely interrupted peristalsis, weak heart action and diminished milk secretion. Prognosis is not always favourable; W. found a 20% mortality.—C. AHARONI.

LEUTHOLD, A. (1943.) *Beitrag zur Kenntnis der Fohlengonitis*. [**Gonitis in foals.**]—*Festschrift Oskar Bürgi, 1943*. pp. 245-258. Horgen-Zürich: Fritz Frei. [In German.] 1806

L. recently encountered a form of gonitis in foals, hitherto unrecorded in Switzerland. The disease is well-recognized in Germany and has been described elsewhere [see PETERS—*V. B.* 6. 535, and BERGE—*V. B.* 7. 347]. The symptoms are usually seen in the first weeks or months of life, but may not appear until the age of 1-2 years. The more severe cases occur in younger animals. Symptoms include hydrops of the stifle joint (bilateral cases occur), undue mobility of the patella, with a clicking noise on walking, and dislocation of the patella, usually lateral. Later, the usual signs of chronic gonitis appear. The lateral ridge of the trochlea is rather flattened and the joint cartilage has erosions, especially near the insertion of the peroneus tertius tendon; at its origin this tendon is fibrillar in structure and instead of arising only from the extensor fossa takes origin from the whole lateral border of the lateral trochlear ridge.

The cause of the condition is unknown. Most authors blame heredity and affected animals should be debarred from breeding. However, developmental abnormalities, infectious diseases, or vitamin and mineral deficiencies cannot be excluded as possible causes. Prognosis is not favourable, but some cases may recover spontaneously and others may be fitted for work if treatment (firing, intra-articular injection of solution of iodine in water containing potassium iodide) is given at an early stage.—E. COTCHIN.

WHITLOCK, J. H., & BAKER, D. W. (1946.) **Report of the feeder lamb loss project in Genesee County, New York.**—*Rep. N.Y. St. vet. Coll., 1944-45*. pp. 97-107. 1807

Records of losses experienced by 27 farmers who were feeding 15,949 lambs during the winter of 1944-45 showed that 6% of the lambs died, and two flocks had outbreaks of clinical gastrointestinal parasitism. Chief causes of death



recorded from 107 P.M. examinations were pneumonia, paratyphoid (*S. typhimurium* and *S. anatum*), "overeating disease", and trichostrongylidosis. A guide to the diagnosis of diseases encountered in feeder lambs is given.

—G. B. S. HEATH.

RUDAU. (1944.) Über Ursache und Verhütung des sog. Herztodes der Schweine. [**Cause and prevention of sudden fatal syncope in pigs.**]—*Dtsch. tierärztl. Wschr. Tierärztl. Rdsch.* 52/50. 5-6. 1808

This condition is due to the preparation or storage of food in zinc and copper containers. Death is usually sudden and associated with alterations in skin colour, foaming at the mouth and nostrils and characteristic limb positions. Inspection P.M. reveals no alteration in the heart except in prolonged poisoning, but the lungs are hyperaemic and oedematous and the stomach contents are large, yielding a characteristic odour. The gastric contents are usually pale green or bluish in copper poisoning. "Dicophren", caffeine and ephedrine may be employed in the treatment. Unnecessary movements should be avoided. Animals alive 8-12 hours after an attack usually survive. The disease may be prevented by the use of iron and tin containers in the preparation of food.—E. F. MCCARTHY.

IMIG, H. (1944.) Ist der akute Herztod der Schweine eine Thyreotoxikose? [**Is acute fatal syncope of swine a thyreotoxicosis?**]—*Dtsch. tierärztl. Wschr. Tierärztl. Rdsch.* 52/50. 211. 1809

In view of reports of DOBBERSTEIN & MATHIAS (1948) that fatal syncope in swine was caused by thyreotoxicosis, the author examined the thyroid glands of 75 pigs, 24 of which had fatal syncope, 33 of which died of other diseases and 18 of which were healthy animals. The last 51 pigs came from farms where no fatal syncope had occurred. In 22 of the animals with fatal syncope, signs of thyreotoxicosis were found. In 23 pigs which died from other diseases and in 13 normal pigs, pathological changes of the thyroid were detected. The author concluded that the thyreotoxicosis was a secondary disease appearing in animals during severe illness. The cause of fatal syncope in swine is still unknown.—E. KODICEK.

KRZYWANEK, F. W., & RUUD, G. (1944.) Die Veränderungen des Elektrokardiogramms beim sogenannten Herztod der Schweine. [**Changes in the electrocardiogram in sudden fatal syncope in swine.**]—*Tierärztl. Z.* No. 2. pp. 23-25. 1810

Using a Siemen's electrocardiograph the authors investigated the technique of its use in both healthy pigs and pigs, either clinically

affected already, or on farms where syncope was present.

After tests to find the most suitable lead positions for the electrodes, the following were selected:—(I) left regio apicis and right regio prescapularis, (II) left regio apicis and tail root and (III) right regio prescapularis and tail root. With (I) and (II) there was a small negative P wave, an almost imperceptible Q, a sharp positive R, an imperceptible S and a sharp negative T wave. With (III), P and Q were similar, but P was positive; R was low, S a sharp negative wave and T a moderate positive wave. Tracings taken from a pig which died of syncope eight hours later showed the R wave much lowered in (I) and (II) and the S wave diminished in (III). The T wave was increased in all three.

Although interpretation of these results in the light of experience in human medicine is difficult, the authors believe that the electrocardiograph can aid in the diagnosis of this specific syncopic disease in pigs.—J. E.

HEPDING, L. (1944.) Sklerotische Splenomegalie und Leberzirrhose beim Schwein. [**Sclerotic splenomegaly and liver cirrhosis in the pig.**]—*Dtsch. tierärztl. Wschr. Tierärztl. Rdsch.* 52/50. 255-257. 1811

This paper describes the macro- and microscopic appearances of a liver lobe and half a spleen taken from a pig in which no other abnormalities were observed. H. states that the histological changes were similar to those observed in Banti's disease in human beings.—A. L. WILSON.

BLOOM, F. (1946.) **Xanthomatosis of the arterial media in a dog.**—*Amer. J. Path.* 22. 519-537. 1812

Examination P.M. of an eight-year-old dog with a previous history of gastro-enteritis and acute interstitial nephritis revealed widespread xanthoma-like lesions in the arteries, kidneys, heart, spleen, prostate, liver, lymph nodes, skin, adrenals and pancreas; the carotid artery and thoracic and abdominal aorta were also affected. Macroscopically, the arteries were thickened, their walls containing numerous, nodular, yellowish lesions 0.1-0.2 mm. in diameter. Microscopically, the earliest lesions consisted of groups of "foam cells" in the media packed with fat droplets, with adjacent muscle cells having some degenerative changes of a fatty type, the underlying intima remaining normal. Histochemical methods identified the lipoids present as non-saturated glycerides and cholesterol or its esters. At later stage lesions involved the adventitia, then the intima, with abrupt disappearance of the inner elastic membrane. The most advanced lesions showed heavy fibrosis, the foam cells being



partially replaced by connective tissue and argyrophilic fibres, with marked narrowing and in some cases complete obliteration of the arterial lumen. Histochemical methods also revealed in this advanced stage the irregular deposition of large amounts of iron-containing material in the lesions.

Other lesions found P.M. in the heart, kidneys, etc., were of the type commonly found in old dogs with a history of subacute interstitial nephritis. The veins were normal.

B. summarizes the pathological condition as an athero-fibro-siderosis and points out that similar spontaneous vascular lesions are unknown in any other subject, including man; xanthomatous lesions in the human subject contain inflammatory cells, giant cells, plasma cells and eosinophiles, all of which were conspicuously absent in the case described. None of the conditions leading to a secondary xanthomatosis due to hyperlipaemia were present in the dog and the lesions are classified as primary xanthomatoses of the hypercholesteraemic type. The histogenesis of the lesions and the source and nature of the lipoids and iron-containing material are discussed.

—MARY C. LOBBAN.

REWELL, R. E. (1947.) **Lipoid pneumonia: a pitfall in diagnosis.**—*Brit. med. J.* March 29th. 409-411. 1813

R. describes a case of lipoid pneumonia in a young woman, observed clinically and P.M., in which uncertainty existed about the origin of the inhaled oil. He points out that although the condition is more common than is often supposed [the published records are discussed in detail], diagnosis is difficult, especially in the absence of an obvious history of ingestion or inhalation of oil; he suggests, however, that it be considered as a diagnosis where chronic infiltration of the lung fails to respond to treatment.

The pathology of the disease is briefly discussed.—L. M. MARKSON.

SCHORNAGEL, H. (1940.) **Functionele en morphologische afwijkingen van het darmkanaal. Diarree-enteritis. [Functional and morphological deviations in the intestines. Diarrhoea and enteritis.]**—*Tijdschr. Diergeneesk.* 67. 628-633 & 634. 1814

The digestive processes in ruminants and non-ruminating herbivorous animals are reviewed briefly. Diarrhoea is a manifestation of imperfect absorption of fluid from the intestine and increased intestinal activity. It may be of nervous origin in

See also absts. 1901-1908 (annual reports); 1909 (diagnostic methods).

cases of fright or fear, a reflex action in painful conditions of internal organs (e.g., cholecystitis, nephrolithiasis, etc.) of endocrine origin, an idiosyncrasy (probably also anaphylactic), due to a decrease of body temperature, or of toxic origin. It may also be due to avitaminosis, dysfunction of the stomach, pancreas or liver, hyperaemia of the intestinal mucosa or venous congestion.

Enteritis is the chief cause of diarrhoea. S. points out that a diagnosis of "acute enteritis" is not easy to make. The increase of blood in the mucosa causes it to swell, but swelling may also be due to auto-digestion occurring rapidly after death. In chronic enteritis there is thickening of the mucosa which is usually irregular; there may be atrophy of the mucosa or even of the whole wall in some cases. The causes of primary and secondary enteritis are considered and it is noted that although enteritis may accompany a gastritis it need not always do so.

An inflamed mucosa has an increased sensitivity to stimulation and peristalsis is increased. The inflammatory exudate dilutes the intestinal contents while the absorption of water is severely impaired. Enteritis of the small intestine need not necessarily produce a diarrhoea unless the large bowel becomes involved. S. concludes by stating that it is still far too often accepted that an aberrant function in an organ must be accompanied by macroscopic and microscopic morphological changes in the cells of the affected organ or tissues.—P. L. LE ROUX.

BIGGS, R., MACFARLANE, R. G., & PILLING, J. (1947.) **Observations on fibrinolysis. Experimental activity produced by exercise or adrenaline.**—*Lancet.* 252. 402-405. [Authors' summary copied verbatim.] 1815

Both strenuous exercise and the injection of adrenaline produce fibrinolytic activity in the blood of normal persons. Both procedures have a similar effect on the blood picture, producing a lymphocytosis, a less marked thrombocytosis, and, later, a neutrophilia. The addition of adrenaline, leucocytes, and platelets, separately or in combination, to normal blood in vitro does not produce fibrinolysis. It seems probable that the fibrinolysis associated with exercise, fear, trauma, and some pathological states follows indirectly the stimulation of adrenaline secretion.

Fibrinolysis, indicating the activation of the proteolytic system of the blood, appears to be a component of the initial phase of the alarm reaction of Selye.

## NUTRITIONAL AND METABOLIC DISORDERS

HUTCHINSON, R. C. (1945.) **The high nutritive value of skim milk.**—*Med. J. Aust.* May 5th.

457-459. 1816  
Annual production of skim milk in Australia



approximates 9,000 million pounds, which represents 837 million pounds of food of high nutritive value on a dry matter basis. Its main use as feed for pigs and dairy calves is wasteful. Fed to pigs, only 13% to 16% of the protein of skim milk is returned as human food. Fed to human beings, 98% of the protein of skim milk is utilized. Skim milk can be used as a supplement to whole milk when the latter is in short supply or expensive.

The value of skim milk containing 1% of fat and added lactic acid is noted (a) in diarrhoeal diseases of artificially fed children, (b) for debilitated and premature children to whom human milk is not available, (c) for supplementing insufficient breast milk, (d) for infants not tolerating whole milk and (e) in the treatment of habitual vomiting.

Suggested methods of increasing the consumption of skim milk include the manufacture of a greater variety of its products, both fermented and unfermented.—D. A. TITCHEN.

SPAFFORD, W. J. (1941.) **South Australian natural waters for farm livestock.**—*J. Dep. Agric. S. Aust.* **44**, 619–628. 1941

In addition to discussing the suitability of South Australian natural waters for livestock S. briefly reviews American work and results obtained elsewhere in Australia. In New South Wales it was considered that horses thrived on waters containing 400 grains of common salt and 550 grains total solids per gal. and cattle and sheep on water containing 800 grains common salt and 1,000 grains total solids per gal. In Queensland, water containing 600–700 grains of salt per gal. caused heavy mortality in sheep; up to 300 grains of salt per gal. may apparently be used safely; water containing 400–600 grains of salt per gal. should be used only in case of necessity for short periods. In Western Australia, standards for good, fair and bad stock waters have been defined as those containing up to 800, 300–600 and over 600 grains, respectively, of salt per gal.

A summary of the analyses of 200 natural waters in South Australia is included. Sodium chloride was the salt most frequently present. About 86% contained less than 300 grains of sodium chloride per gal. and about 76% held less than this amount of total solids. Magnesium sulphate was sometimes present in injurious amounts. Practically all South Australian waters containing less than 300 grains per gal. of total soluble salts were taken readily by all farm livestock without ill effects; up to 500 grains per gal. of total soluble salts were usually safe for dairy cows and working horses and up to 700 grains per gal. of total soluble salts were satisfactory for beef cattle and sheep. Cases were recorded of beef cattle and sheep doing relatively well on

waters containing 1,000 grains of total soluble salts, but this success could not be forecast and had to be discovered by trial. A general experience was that animals on "grass" tolerated saltier water than those upon bush; this was also the case where feed was luxuriant and nutritious, as against poor, scanty pasturage.—M. C. FRANKLIN.

KRUPSKI, A. (1944.) **Mangelerscheinungen des Rindes auf unseren Hochweiden. [Deficiency symptoms in cows on Alpine pastures.]—Schweiz. Arch. Tierheilk.** **86**, 509–513. 1948

The symptoms of this disease, which appeared in Alpine regions and was of great economical importance, were those of depraved appetite, which was observed in calves after weaning. Dry feeding during the winter increased symptoms and most severe cases were observed in early spring. Retarded growth, staring coat, diminished milk secretion, anorexia, emaciation and impaired fertility were some of the serious consequences.

The main cause of the disease appears to be a lack of phosphorus and a surplus of calcium. Whilst a typical sample of hay from the plains contained 9.35 g. calcium per kg. hay and 2.72 g. per kg. phosphorus, 12.9 g. per kg. calcium and 1.3 g. per kg. phosphorus were contained in an average sample of hay from the alpine pasture, the phosphorus content reaching the low level of 0.6 g. per kg. in other samples. Successful treatment recommended was by an aqueous drench of monosodium phosphate which was soluble and easily absorbed.—C. AHARONI.

MCCLYMONT, G. L. (1945.) **Mineral requirements of stock in New South Wales. Unnecessary and uneconomic use of licks.** pp. 10. N.S.W.: Department of Agriculture, Division of Animal Industry. 1949

M. outlines the conditions under which mineral supplements are considered necessary and beneficial in New South Wales, at the same time deploring the indiscriminate use of licks. Licks are often supplied by farmers where actual food intake is insufficient for maintenance of life or production, in the mistaken belief that mineral supplements alone will restore the nutritional status of stock.

In New South Wales it is not necessary to provide copper, cobalt, sulphur, iodine, manganese, magnesium, zinc or potassium for stock. In South and Western Australia and Tasmania, copper and cobalt deficiencies have been recorded and these have been corrected by top-dressing pasture with the appropriate mineral salts, or by providing these minerals as drenches or licks. Sulphur is available to stock as cystine or methionine from plant and animal products. No benefit is obtained from iodine supplements unless iodine



deficiency is recognized. Manganese deficiency is manifest in poultry as perosis, but a deficiency is not seen in other stock. Nervous symptoms have been reported in calves in New South Wales; a supplement containing magnesium corrects these symptoms. Under field conditions zinc and potassium deficiencies have not been recorded. Sodium chloride, calcium and phosphorus can best be supplied as additions to the food. Piglets may be treated for iron deficiency by applying ferrous sulphate in solution to the udder of the sow.—D. A. TITCHEN.

SKINNER, J. T., & MCHARGUE, J. S. (1946.) **Supplementary effects of arsenic and manganese on copper in the synthesis of hemoglobin.**—*Amer. J. Physiol.* **145**, 500–506. 1820

Rats were fed for nine weeks on a basal ration composed mainly of skim milk powder and sucrose and adequately supplemented with Fe and Cu. The addition of 1 or 5 p.p.m. of As increased the haemoglobin level to approximately 105% of that in control animals. The rate of growth was not affected. The addition of 7.7 p.p.m. of Mn to this basal ration or to a ration of whole milk and glucose, supplemented with Fe and Cu, increased the synthesis of haemoglobin and maintained it at a higher level than that observed in rats receiving these rations supplemented with Fe and Cu only. When both Mn and As were added to the skim milk-glucose ration the effect on haemoglobin formation was greater than when either was added alone.—E. M. CRUICKSHANK.

JARRETT, I. G. (1946.) **Alloxan diabetes in the sheep.**—*Aust. J. exp. Biol. med. Sci.* **24**, 95–102. 1821

Alloxan diabetes in sheep is of particular interest, since the blood glucose is not appreciably affected by starvation and is lowered only by massive doses of insulin; moreover, complete pancreatectomy is extremely difficult. This study was made to investigate further fat and carbohydrate metabolism in sheep, using diabetic animals.

A sustained, uncomplicated, diabetic condition was produced in three sheep by single intravenous injections of alloxan of 90–100 mg. per kg. body weight. In addition, marked liver and kidney damage occurred in five animals with the same dose and in one which received twice the dose. Three other sheep were injected with 90–100 mg. per kg. body weight and they developed the characteristic preliminary hyperglycaemia. Within 24 hours two were slaughtered and P.M. examination revealed degeneration of islet tissue; the third sheep returned to and remained in normal condition. The diabetes produced was typical, with hyperglycaemia, ketonuria and glyco-

suria, all of which could be controlled by insulin. J. was unable to differentiate between  $\alpha$  and  $\beta$  cells in islet tissue of the sheep, but observed in most specimens degeneration in both acinar and islet tissue. Estimations of the insulin content of the pancreas were attempted, but were considered unsatisfactory. All sheep used were Merino and Merino-Corriedale ewes weighing 30–48 kg.

—W. K. WHITTEN.

I. ANON. (1945.) **Wheat gluten and canine hysteria.**—*Nutr. Rev.* **3**, 176–178. 1822

II. WEIPERS, W. L. (1947.) **Diet and canine hysteria.** [Correspondence.]—*Brit. med. J.* Jan. 4th. 84. 1823

III. PUGH, L. P. (1947.) **Diet and canine hysteria.** [Correspondence.]—*Ibid.* Jan. 18th. 118. 1824

I. Canine hysteria is described and the findings of various workers are discussed. WAGNER & ELVEHJEM (1944) concluded that the disease was dietary in origin and appeared to depend on the level of wheat gluten in the ration. It was due to a toxin rather than a deficiency and sensitivity to the toxic agent in wheat gluten appeared to be characteristic only of the dog. Among other possible causes, one should consider the question of the extent to which commercial processes contribute to the elaboration of the toxic principle.

II. Discussing the article by MELANBY [see *V. B.* **17**, 33], W. agrees that a study of the effect of feeding "agenized" wheat gluten to dogs is indicated and, if this fails to produce "canine hysteria", then a study of the effect of the "agene process" on all or part of the vitamin B complex. RICHARDS (1945) observed a pyridoxine deficiency in sucking rats whose dams had received a diet with high vitamin B<sub>1</sub> content. Fits were not observed in litters whose dams received national wheatmeal flour (85% extraction) instead of white flour, but this wheatmeal flour had not been subjected to any bleaching or improving process. W. considers that the hysteria syndrome may be manifested only in adult rats when the toxic factor is present in large quantities and that small quantities can only be demonstrated in sucking rats whose dams have been fed on a hysteria-producing diet. W. states that in experiments carried out before 1939, the toxic factor was much greater in dog-biscuits than in white bread, yet hysteria developed frequently in kennels where ship's biscuits (emergency lifeboat rations) were fed. The question of high temperatures used in baking, for example in the baking of biscuits, needs to be taken into account.

While conceding that specific hysteria occurs as described and is caused by a toxic factor in food, W. emphasizes that hysterical attacks, clinically indistinguishable from those described,



occur as a result of the distemper virus in dogs that have had no hysteria-producing foods.

III. P. considers that the findings of MELANBY [see II] will prove to be of the greatest assistance to those who are studying canine encephalomyelitis and distemper virus encephalitis, since in both these diseases the "hysteria" syndrome frequently complicates or is superimposed on the other symptoms. P. thinks that a thorough study should be carried out of the histology of the central nervous system of (a) heavily "agenized" dogs and (b) "agenized" dogs infected by distemper virus. In a study of disseminated encephalomyelitis of the dog, of 14 cases, four had demyelination of the type found in disseminated sclerosis and the hypothetical demyelinating toxin could not be discovered.

—E. M. J.

CRUZ, W. O., DE MELLO, R. P., & DA SILVA, E. M. (1944.) Estudos sôbre a anemia produzida em cães porbenzoato de estradiol. [**The anaemia produced in dogs by administration of oestradiol benzoate.**]—*Mem. Inst. Osw. Cruz.* **41.** 167–177. [English summary.] **1825**

In this investigation, 60 dogs were injected with large doses of oestradiol benzoate (1.2–8.6 mg. per kg. body weight) in vegetable oil. Blood changes appeared after a latent period of 5–6 days and took the form of thrombocytopenia and aplastic anaemia. Death occurred in 1–8 weeks. Repeated blood transfusions given during the stage of acute anaemia did not affect the period of survival of the animals.

P.M. examination revealed intestinal haemorrhages in the mucosa, particularly in the jejunum. Irregular findings included leucocytosis, purpuric skin lesions, visceral haemorrhages, most marked in the lungs, epicardium and endocardium and bone marrow. These latter changes appeared to depend on the route of administration of the hormone, the solvent and individual susceptibility.

The mechanism of the anaemia remained obscure, but an important contributory factor was the loss of blood from intestinal haemorrhages. 30–70% of the total haemoglobin lost was found in the faeces. Intra-organic blood destruction, as determined by a gall-bladder to kidney fistula, appeared to be practically nil.

Blood loss was found to be insufficient in itself to impede blood regeneration in the bone marrow. The action of oestradiol benzoate appeared to hinder the start of blood regeneration, rather than to affect regeneration once it became well established.—I. W. JENNINGS.

SCRIVNER, L. H. (1946.) **Experimental edema and ascites in poults.**—*J. Amer. vet. med. Ass.* **108.** 27–32. **1826**

Considerable losses from a condition characterized by subcutaneous oedema and ascites have been reported in recent years amongst young turkeys. Poults 5–8 days old have been attacked, 15–20% of a flock being affected and death following soon after the occurrence of symptoms. Losses usually ceased after the end of the second week.

In an attempt to determine the cause of this condition, various sodium compounds were added to a basic starter mash or to the drinking water of groups of one-day-old poults. Concentrations of 0.5–2.0% sodium chloride in the drinking water and of 2–3% in the mash caused oedema and ascites; deaths occurred within 48 hours when a concentration of 2% sodium chloride was given in the drinking water, but not before seven days when it was given in the mash. Up to 3% sodium bicarbonate in the mash did not cause the condition, but concentrations in the drinking water of 0.3–0.6% caused typical mortality within 15–23 days. In view of the results obtained with the chloride and bicarbonate of sodium, 0.75% solutions of the citrate, iodide, hydroxide, carbonate and sulphate were given as drinking water to further groups of poults. Severe mortality without oedema or ascites occurred with the carbonate and iodide within 5–7 days and it was assumed that these substances were so toxic that the dilutions used caused death before the oedematous condition could develop. Typical oedema was produced with the citrate and sulphate, but only a very few cases occurred with the hydroxide, the concentration of which had to be reduced to 0.1% owing to its unpalatability.

Other experiments were carried out with 0.1% and 0.5% potassium iodide and 7.5% calcium carbonate in the mash, but these substances did not cause the condition.

Finally, to determine whether formaldehyde fumigation would produce the disease 120 recently hatched poults were fumigated by the formaldehyde-potassium permanganate method for one hour and were then kept under observation, together with 50 similar poults which had not been fumigated. By the 16th day, eight cases of oedema and ascites had occurred amongst the fumigated poults and by the 26th day, 25 other deaths had occurred in this group, but none of them had oedema; during the whole period only five of the control group died.

S. points out that the sodium content of certain foods may well be over 1% and that if a further 0.5–1.0% sodium chloride is added to the mash, as is customary, the total content may be high enough to be toxic. He therefore suggests that the sodium intake should be investigated in the case of poult flocks when losses from oedema



and ascites are reported. The results of the formaldehyde fumigation are considered to support the supposition that anything causing injury or

See also absts. 1775 (diet and parasitism); 1901-1908 (annual reports).

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

HERRE, W., & BEHRENDT, R. (1940.) Vergleichende Untersuchungen an Hypophysen von Wild- und Haustieren. [Comparative studies on the hypophyses of wild and domestic animals.] —Z. wiss. Zool. 153. [Abst. from abst. in *Tijdschr. Diergeneesk.* 71. 999.] 1827

The authors studied the hypophyses of pigs and found that they were greater in domesticated than in wild animals. In contrast to other mammals the weight of the hypophysis of the pig grew heavier in proportion to the total body weight. The size of the hypophysis is apparently a question of constitution. Species with a thick fat layer, such as the bulldog, have a relatively large hypophysis.—S. M. G.

AXELSSON, J., & KIVIMÄE, A. (1946.) Husdjurens kritiska temperatur. [Critical temperatures for domestic animals.]—K. Landtbr.Akad. Tidskr. 85. 253-268. [English summary.] 1828

In mammals exposed to rising environmental temperatures, heat production decreases directly to a point at which chemical regulation ceases and heat loss by physical means comes into play.

The environmental temperature at which this occurs is called the critical temperature. There is a small temperature range, above the critical temperature, at which no adjustment of the body temperature occurs, this range being known as the thermal neutral zone.

In investigations made with farm animals, no thermal neutral zone could be detected. In these animals the critical temperature was therefore the optimum temperature, at which loss of body heat was at a minimum. The optimum temperature appeared to be independent of the animals' nutritive state. The critical temperature decreased at the time of shedding the hair. The decrease was very marked in sheep after shearing.—J. E.

I. ROBINSON, K., & LEE, D. H. K. (1941.) Reactions of the pig to hot atmospheres.—*Proc. roy. Soc., Qd.* 53. 145-158. 1829

II. ROBINSON, K., & LEE, D. H. K. (1941.) Reactions of the cat to hot atmospheres.—*Ibid.* 159-170. 1830

III. ROBINSON, K., & LEE, D. H. K. (1941.) Reactions of the dog to hot atmospheres.—*Ibid.* 171-188. 1831

IV. LEE, D. H. K., & ROBINSON, K. (1941.) Reactions of the sheep to hot atmospheres.—*Ibid.* 189-200. 1832

interference to the respiratory and circulatory systems may produce the disease.—J. D. B.

I. In experiments on three male pigs exposed to experimentally produced hot atmospheres with varying temperatures and humidities, it was found that atmospheric temperatures of 105°F. could not be tolerated for seven hours when the atmosphere was humid and that temperatures of 95° and 100°F. could be tolerated only when the humidity was below 65%. Severe restlessness occurred with rectal temperatures of 106°F. and 107°F. was near the limit of continued existence. Respiratory and pulse rates rose with the rectal temperature. Reduction of humidity caused definite improvement of these reactions only when temperatures and humidities were high. Half replacement of water lost at high temperatures also caused marked improvement. Repeated exposure tests gave no evidence of acclimatization. The principal methods of heat loss were by evaporation from a moist mouth, snout and upper respiratory tract and by an increased respiratory volume and insensible skin evaporation.

Hosing was effective as a means of resuscitation.

II. Rectal temperatures in male cats exposed to artificially produced hot atmospheres began to rise at a dry bulb temperature of 90°F. The ability to withstand high atmospheric temperatures was increased with decreased humidity. Oral replacement of water at high temperatures reduced tidal and respiratory volumes but did not affect other functions. Respiratory rates rose slightly before, but pulse rates rose with rectal temperatures. Slight acclimatization occurred in a hot wet atmosphere, but none in a hot dry one.

The main methods of heat loss were by increased respiratory evaporation and, when body temperature rose to 104°F., by evaporation of saliva which the cat spread over its coat.

III. The rectal temperature, respiratory rate and pulse rate in two dogs increased with an increase in atmospheric temperature. A reduction of humidity had a lowering effect on these reactions. Tidal volume decreased markedly with increase in respiratory rate. Some evidence of acclimatization was found, particularly to a hot dry atmosphere. Open-mouthed panting began with rectal temperatures of 100°F. Hosing was effective as treatment.

IV. Observations on three sheep subjected to artificially produced hot atmospheres with different humidities and temperatures revealed a



rise in rectal temperature, respiration and pulse rates with increases in atmospheric temperature. The effect was less marked when the humidity was reduced. No definite evidence was obtained of acclimatization to a hot dry or hot wet atmosphere. Oral replacement of water had little effect on these reactions.

Sheep had greater tolerance to hot atmospheres than all other animals studied. Open-mouthed panting did not occur until a rectal temperature of 106°F. was reached.—D. C. B.

MADELENAT, P. (1943.) Le déclenchement et l'entretien de la sécrétion lactée. [**The induction and maintenance of lactation.**]—*Rev. Méd. vét., Lyon et Toulouse*. 94. 49-65. 1933

This is a review of the physiology of lactation dealing mainly with the endocrine aspects of mammary development and milk secretion. Most of the references quoted are prior to 1939.

—ALFRED T. COWIE.

HOUDINIÈRE, A. (1945.) Le colostrum de vache. Composition—propriétés. Répercussions en industrie laitière. [**The colostrum in the cow.**]—*Lait*. 25. 27-50. 1934

This is an article dealing with the effect of adulterating milk with colostrum and its importance in the milk industry. The addition of colostrum to milk may increase the rate at which rancidity occurs and the low pH of the colostrum may cause difficulties in the manufacture of condensed and powdered milk. The flavour of butter may be affected by increased rancidity. The high lecithin content of the colostrum may give rise to a fishy flavour if the lecithin molecule undergoes certain changes.—R. MORGANSTERN.

DELAGE, B. (1938.) Le système lipoprotéidique du sérum sanguin. [**The lipid-protein system of the blood serum.**]—*Arch. Inst. Pasteur Maroc*. 2. 1-232. 1935

The lipoids in the blood can be divided into three fractions according to the ease with which they can be extracted by various solvents and to the strength of the bond between the lipoids and blood proteins. One of these fractions (non-extractable lipoids) is not extracted by cold ethereal alcohol and only liberated by prolonged treatment and heating.

The extractable lipoids are mostly bound to serum albumin and the non-extractable lipoids to globulin, each constituting a separate physical system. In disease the blood lipoids may be greatly decreased. During aging the extractability of the lipoids decreases while proteins are more easily precipitated.—J. M. ROBSON.

RAMSAY, W. N. M. (1946.) **Plasma bilirubin in the horse.**—*Vet. J.* 102. 206-211. 1936

R. carried out a series of investigations with

a view to determining primarily what pigment was responsible for the high colour of horse plasma. On making spectroscopic observations, he found a broad absorption band in the blue-green and blue of the spectrum, which had its maximum in the region of 480 mμ.

Horse plasma contained about three times as much bilirubin as human plasma and fasting horses for 48 hours caused a marked increase in plasma bilirubin. In several specimens of normal sheep and cattle blood not the slightest trace of bilirubin could be detected.—J. S. S. I.

LEUE, P. (1944.) Längs- und Querlüfter der Mahlfächen beim Zubeissen unter Pferden. [**Uneven wear of the grinding surfaces of the teeth of horses.**]—*Berl. Münch. tierärztl. Wschr.* /*Wien. tierärztl. Mschr.* April 14th. 123-125. 1937

The natural tendency is for the masticatory surface or table of molar teeth in the horse to be flat. The various shapes presented by wear are discussed. The long axis of molar teeth is greater than the transverse, a fact which influences the type of wear exhibited; in the main, the tables can be classified as approaching flat, concave, or convex when viewed from lingual to buccal edge. The association between teeth wear and jaw movement and its general effect upon feeding habits, digestion and predisposition to disease are outlined.—C. W. OTTAWAY.

OSTER, K. A. (1945.) **Demonstration of a cyclic change in the histochemistry of the kidney synchronized with the estrus cycle in the rat.**—*Endocrinology*. 36. 92-97. 1938

Tissue aldehydes exhibit a characteristic distribution pattern in the rat kidney, as judged by their reaction with fuchsin sulphurous acid. The deepest staining is seen in the intercortico-medullary zone. During oestrus the aldehydes tend to increase and during dioestrus they decrease. Experiments on ovarian removal and with ovarian hormones give no clear explanation of these findings.—J. M. ROBSON.

KELLEY, R. B., & SHAW, H. E. B. (1943.) **Fertility in sheep. An experimental study of periodicity of oestrus and non-breeding seasons in Australia.**—*Bull. Coun. sci. industr. Res., Aust.* No. 166. pp. 28. 1939

Preliminary observations had shown that contrary to a widely held belief Merino ewes in Australia did not come on heat regularly throughout the whole year. Further observations, using a greater variety of sheep, were carried out at the McMaster Field Station in New South Wales and at widely scattered centres in Queensland and Tasmania.

Ewes to be observed for occurrence of



oestrus were all kept in one paddock. 5% of vasectomized rams were available at all times. These were suitably coloured on the brisket daily. As ewes came on heat (indicated by a coloured rump), they were moved into an adjoining paddock. All ewes were ear-tagged and tattooed with an identification number. At the end of each 17-day period all rams were withdrawn and fresh rams which had been resting replaced them. A different colour was used for marking the brisket. All ewes were returned to the same paddock. Observations were made at daily intervals.

Results were expressed in the monthly number of ewes on heat and the monthly number of ewes examined; observations were expressed in percentages.

Examination of results showed that, broadly, the sexual season was similar in every year and at every centre. The existence of a breeding season (autumn and winter) and a non-breeding season (spring and summer) was clearly established by alternating periods of sexual activity and of quiescence.

The data revealed certain anomalies: *e.g.*, sexual activity appeared to have been affected by transference of ewes from one district to another, there were year-to-year variations in time of onset and intensity of sexual activity, and in some ewes oestrus occurred in the non-breeding season. These anomalies provided a basis for further observations.

Significant differences were also revealed in the sexual behaviour of the different breeds and strains of sheep: *e.g.*, there was a relatively long breeding season in the Merino and a relatively short breeding season in the Border Leicester and the onset of oestrus in the Dorset Horn was relatively early in the season.

Individual peculiarities included the constant coming on heat of certain ewes either late or early in the breeding season. Certain individuals, by consistently coming on heat earlier and continuing to come on heat for a longer period, had longer breeding seasons than the remainder. These characteristics were attributed to the heredity of the individuals concerned, which would probably provide material for genetical selection in the direction of either an earlier or later breeding season.

K. emphasizes the need for the grazier to determine the optimal mating times for partic-

ular flocks in particular environments.—C. S. S. SCHARRER, E., & SCHARRER, B. (1945.) **Neuro-secretion.**—*Physiol. Rev.* 25. 171–181. 1840

Certain nerve cells resemble gland cells in that they show the cytological features of glandular activity, *i.e.*, they produce and discharge granules and colloid-like material with the characteristics of protein substances. The concept of "neuro-secretion" has been formulated with regard to these cells, though no physiological effect of the material produced is known. Such cells occur in the central nervous system of invertebrates and vertebrates. In fishes and amphibians the secretory granules appear to originate in association with basophile constituents of the cells, *i.e.*, chromatin, basophile cytoplasm, or Nissl bodies. In insects and fishes a peculiar pathway of the products of neurosecretory cells can be observed along the axons to glands of internal secretion. In two instances in invertebrates the origin of physiologically active substances was traced to parts of the central nervous system which contain neurosecretory cells.—J. M. ROBSON.

WEBER, W. (1943.) *Anatomie für die Praxis.* 4. Die Rückenmarkspunktionsstellen beim Schwein. [**Anatomy in practice. 4. Puncture of the spinal cord in swine.**—*Schweiz. Arch. Tierheilk.* 85. 101–105. [For part 3, see *V. B.* 13. 185.] 1841

For lumbar puncture the site recommended is either the lumbo-sacral space or, for older pigs, the 5th–6th lumbar intervertebral space. The projections of the pelvic bone serve as landmarks for injection, as a line drawn between the two tuber coxae passes over the caudal end of the spine of the 5th lumbar vertebra and one drawn between the most prominent projections of the iliac crests (spina iliaca superior anterior) over the mid-spine of the 6th lumbar vertebra. The injection needle should be directed downwards and forwards: in a 100 kg. eight-month-old pig taken as an example, the distance from skin to epidural space was approximately 5 cm. The poorly developed vertebral laminae in the pig present large intervertebral spaces.

A review of the occipital region suggests that for technical as well as anatomical reasons occipital puncture is impracticable in the pig.

The article is illustrated by photographs and relevant structural measurements of pigs of varying size and age are given.—C. W. OTTAWAY.

See also *absts.* 1707 (hormones and tuberculin); 1708 (plasma viscosity in TB.); 1728 (phagocytosis); 1786, 1788 (hormones and cancer); 1794–1798 (hormones and reproduction); 1893 (genitalia of nutria); 1910 (functional anatomy of the cat); 1913 (pre-natal life); 1914 (essentials of histology).

## POISONS AND POISONING

TAPERNOUX, A., DARRASPEN, E., & GONNET. (1945.) *Recherches sur la toxicologie de l'arsenic chez les équidés.* [**Arsenical poisoning**

**in horses.**—*Bull. Acad. vét. Fr.* 18. 328–331. 1842

From the results of clinical examination of



horses employed in a mining establishment where an arsenical ore (mispickel) was being worked, all animals were found to be in a good state of physical health despite the poor quality of the feeding stuffs, except for one horse which was heavily parasitized. Analyses of the mane and coats indicated an As content of 43–450 p.p.m. compared with normal values of 0.5–3 p.p.m. This As content was definitely not due to contamination by arsenical dust as a thorough preliminary grooming and washing of the coat did not reduce the highest figure by more than about 10% of the original value. The results are quoted to indicate the need for extreme caution in interpreting the results of analyses in cases of suspected chronic arsenical poisoning.—A. EDEN.

CAMERON, G. R., CARLETON, H. M., & SHORT, R. H. D. (1946.) **Pathological changes induced by lewisite and allied compounds.**—*J. Path. Bact.* 58. 411–422. [Authors' summary copied *verbatim.*] 1843

A group of poisons is described, the members of which exert an action typified by that of 2

chlorovinylchloroarsine (lewisite I). When applied to the skin they produce blistering and necrosis. They severely damage the eyes, are highly irritating to the nose and respiratory passages when inhaled, and destroy the mucous membrane of the mouth, stomach and intestines when ingested. They are easily absorbed into the circulation, thereby exerting serious action on the blood vessels and various organs. Excretion occurs by way of the bile passages and kidneys, in the course of which much damage is produced in the liver, bile ducts and gall bladder but less in the kidneys and urinary tract. Capillary permeability is greatly increased and the massive depletion of circulating blood plasma leads to a condition not unlike burn shock: this we have called "lewisite shock". It may terminate life in a few hours or days. Death may also result from hepatic insufficiency, either in the initial stages—most often the first week—or after some delay. Occasionally an acute haemolytic crisis is precipitated, with a pathological picture identical with and as fatal as that due to arseniuretted hydrogen.

See also *absts.* 1808 (syncope in pigs caused by zinc and copper); 1809 (thyrotoxicosis and syncope in pigs); 1817 (salts in drinking water); 1822–1824 (wheat gluten and canine hysteria); 1826 (sodium salts and turkeys).

## PHARMACOLOGY AND THERAPEUTICS

FALK, J. E. (1944.) **Scientific method in the evolution of new drugs. Part IX. Depressants of the central nervous system: hypnotics, narcotics, and anaesthetics.**—*Aust. J. Sci.* 7. 48–53. 1844

F. outlines the theories concerning the action of depressants of the central nervous system, particularly narcotics, on cells. The actions observed are attributable to physico-chemical rather than to purely chemical reactions and theories of narcotic action have been advanced, based on the knowledge that depressants are usually preferentially dissolved in the lipoids which abound in nerve cells; they are strongly adsorbed at the cell surface, they increase the permeability of cell membranes and their narcotic properties may also be related to their action in producing reversible flocculation of cell colloids. QUASTEL & WHEATLEY (1933) found that many narcotics inhibit the oxidation of metabolites and the possibility that narcosis is the outcome of antagonism between drugs and enzymes is considered in some detail. Though a wide knowledge of the actions of depressants on cell surfaces and enzymes has been accumulated, the reason why these actions should lead to narcosis is little understood.—W. P. ROGERS.

FRISK, A. R., HAGERMAN, G., HELANDER, S., & SJÖGREN, B. (1947.) **"Sulpha-combination"**

—a new chemotherapeutic principle.—*Brit. med. J.* Jan. 4th. 7–10. 1845

This is a combination of sulphathiazole, sulphadiazine and sulphamerazine. Its advantage is that the risk of renal complications due to the formation of deposits is decreased, as the three drugs can each be dissolved up to their maximum solubility. The doses can thus safely be increased in infections with more resistant bacteria.

—J. M. ROBSON.

SANDSTEDT, H. (1946.) **Sulfatylbehandling vid tarminfektion hos kalv och svin. [Sulphathalidine therapy of intestinal disease in calves and swine.]**—*Skand. VetTidskr.* 36. 65–69. [Abst. from English summary.] 1846

Cases of diarrhoea and enteritis in calves and pigs were treated with sulphathalidine (2-phthalylsulphanilamidothiazole). The preparation appeared to have good bactericidal effect and to be only slowly absorbed from the intestine. The dose administered was 0.5 g. or 0.25 g. per kg. body weight on 2–3 days. It seems probable that the dose can be further reduced with equally good result.

STOLZ, A. (1944.) **Veränderungen im Blutbild bei Sulfonamidgaben. [Changes in the blood picture in sulphonamide administration.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 218–220. 1847



The effect of sulphonamides on the blood picture was studied in 12 healthy g. pigs and two women. The sulphonamides tested were mesudrin [marfanil], prontosil, orsulon [sulphapyridine] and sulphathiazole: they were administered by injections or orally in small doses of 1 ml. per day or larger doses of 8 ml. for three days to the g. pigs. There was no change in the red cell count and the white cell count remained constant when small doses of sulphonamides were given but decreased from 11,700 to 7,600 when 8 ml. of mesudrin were injected into three g. pigs for three days. Orsulon was administered for one day to the two human beings in two doses of 2 g. each. No marked effect was found in the two human beings. The differential blood picture revealed a slight granulocytopenia and relative lymphocytosis after administration of sulphonamides.—E. KODICEK.

ANDERSEN, A. H., & SIMESSEN, M. H. (1943.) **Investigations on the passage of sulfathiazole through the blood-liquor barrier in various forms of meningitis.**—*Acta med. Scand.* **114.** 104–126. [In English.] **1848**

In normal people and in patients not affected with meningitis the ratio of sulphathiazole in the cerebrospinal fluid and blood is about 0.2. In ten patients with tuberculous meningitis the average ratio was 0.42 (0.32–0.55). No appreciable increase was found in patients with primary or secondary lymphocytic meningitis or with poliomyelitis. In patients with purulent meningitis there was an increase in the ratio, which fell with improvement of the clinical condition.

—J. M. ROBSON.

MARTIN, A. R. (1946.) **The use of mice in the examination of drugs for chemotherapeutic activity against *Mycobacterium tuberculosis*.**—*J. Path. Bact.* **58.** 580–585. [Author's summary copied *verbatim*.] **1849**

Observations on the response of mice to graded intravenous doses of *Mycobacterium tuberculosis*, "human type", show that small doses (e.g., 0.01 mg.) rapidly induce a condition of high resistance to reinfection with a large dose. A dose of 1 mg. given in this way to mice not previously infected causes the death of 95 per cent. of the animals in approximately 21 days.

This rapidly fatal infection forms a convenient basis for the preliminary assessment of the chemotherapeutic power of drugs. An increase in mean survival time of treated over control animals of 1–2 days is significant at the  $p = 0.05$  level. The method of standardisation of manipulative details which makes this practicable is described.

A typical experiment using 4:4'-diaminodiphenyl sulphone and two solubilised derivatives

demonstrated significant increases in mean survival time of the treated animals as compared with the controls.

— (Undated.) **Penicillin in veterinary medicine.** pp. 19. Rahway, N.J.: Merck & Co., Inc. **1850**

This is an illustrated brochure. The antimicrobial action of penicillin is discussed and lists are given of organisms classified as highly susceptible, moderately susceptible and slightly susceptible or insusceptible. Absorption and excretion, toxicity, chemical properties, storage, preparation of solutions, methods of administration and veterinary uses are covered.

Although the treatment of diseases of animals with penicillin is largely in the experimental stage, some of the more important possibilities are presented as a guide. There is a table summarizing results of penicillin therapy for mastitis, and there are indications that penicillin may be helpful in the treatment of blackleg, gas gangrene, malignant oedema, anthrax, swine erysipelas and canine leptospirosis, actinomycosis and miscellaneous infections.—E. M. J.

ANDREWS, G. W. S. (1947.) **Distribution of penicillin in the eye after subconjunctival injection.**—*Lancet.* **252.** 594–596. [Author's summary copied *verbatim*.] **1851**

The distribution of penicillin in the various tissues and fluids of the eye has been studied in rabbits after subconjunctival injection of 50,000 units of pure sodium penicillin dissolved in 0.5 c.cm. of normal saline into one eye.

In the injected eye high levels were found in all the tissues of the eye except the lens and the vitreous; within three to six hours these levels had fallen to below an adequate bacteriostatic level.

A similar distribution was found in the opposite (uninjected) eye, but with lower levels. The penicillin content of most of the tissues of the opposite eye exceeded that of the blood.

The highly purified penicillin now obtainable is non-irritant to the eye and can thus be safely given in large doses by subconjunctival injection with the production of very high local concentrations in the ocular tissues. Its use may prove a valuable advance in the treatment of infections of the eye by penicillin-sensitive organisms.

MACNEAL, W. J., FILAK, L., & BLEVINS, A. (1946.) **Conjoined action of penicillin and bacteriophages.**—*J. Lab. clin. Med.* **31.** 974–981. [Authors' summary copied *verbatim*.] **1852**

Cultures of staphylococcus moderately resistant to penicillin and to bacteriophages may be more effectively inhibited in their growth by a combination of these agents. Similar observations have been made on cultures of colon bacilli and



some types of streptococci. Severe types of infection with staphylococcus, such as chronic osteomyelitis, facial carbuncle, and staphylococcal endocarditis have responded to combined therapeutic use of penicillin and bacteriophages. Intestinal perforation associated with general peritonitis and bacteremia has been successfully treated with coli bacteriophage and penicillin. Bacterial endocarditis due to streptococci relatively resistant to penicillin has responded favorably to treatment with penicillin and suitable streptococcus bacteriophage.

UNGAR, J., & MUGGLETON, P. (1946.) **The effect of penicillin on the growth of human type *M. tuberculosis*.**—*J. Path. Bact.* 58. 501-504. 1853

The authors state that they had previously found that the addition of small amounts of penicillin to growing cultures of *M. tuberculosis* appeared to increase the rate and extent of growth.

They now report that when pure penicillin with a potency of 1,650 units per mg. and impure penicillin with a potency of 590 units were added respectively to growing cultures of a human strain of *M. tuberculosis* in liver extract broth and also in a synthetic medium the increase in growth was the same in each. Thus the effect was considered to be due to the penicillin itself and not to the impurities.

ILAND, C. N. (1946.) **The effect of penicillin on the tubercle bacillus.**—*J. Path. Bact.* 58. 495-500. [Author's summary copied *verbatim*.] 1854

Recently isolated strains of *M. tuberculosis hominis* were found to be inhibited by penicillin at strengths of 20-80 units per c.c.; the effect appeared to be bacteriostatic. An avirulent laboratory strain was not inhibited; indeed it destroyed the penicillin. The difference between these results and those of other workers appears to be due to differences in technique and the strains used. The requirements of in-vitro methods for testing *M. tuberculosis* are briefly discussed.

FAIRLEY, N. H., (1946.) **Researches on paludrine (M.4888) in malaria. An experimental investigation undertaken by the L.H.Q. Medical Research Unit (A.I.F.), Cairns, Australia.**—*Trans. R. Soc. trop. Med. Hyg.* 40. 105-153. Discussion pp. 153-162. 1855

The main investigations carried out by the L.H.Q. [land head-quarters] Medical Research Unit at Cairns were designed to ascertain (1) the value of paludrine as a suppressive agent and causal prophylactic, (2) its value as a therapeutic agent (schizonticidal action), (3) its value as a gametocide, (4) its possible effects on the pre-erythrocytic or hypothetic exo-erythrocytic forms

and (5) the possible toxic effects resulting from its administration.

Paludrine in non-toxic dosage is a complete causal prophylactic in falciparum malaria and has a distinct lethal action on the pre-erythrocytic forms of *P. falciparum*. Sporozoites are probably not susceptible to the drug. Paludrine functions as a partial causal prophylactic in all cases and asexual stages fail to reach the blood during treatment. This fact suggests an inhibitory action on schizogony of the exo-erythrocytic forms as suggested by DAVEY (1944). The drug is a powerful schizonticide in *P. vivax* and *P. falciparum* malaria in which merozoite formation is prevented. Clinical attacks of *P. falciparum* malaria are usually controlled and radical cures produced by a ten days' course of 300 mg. of paludrine a day. Clinical cure is also obtained in *P. vivax* infections but further work remains to be done on the determination of the proportion of radical cures and the best standard course of treatment to follow. Gametocytes in the blood of the carrier do not appear to be affected, but sterilization of the infection occurs in the gut of the mosquito fed on *P. falciparum* and *P. vivax* gametocyte carriers 1-2 hours after the first dose of the drug is taken and sterilization persists until the drug has been eliminated from the body. As regards toxicity, the difference between the effective therapeutical dose and the toxic dose is considerable.

F. points out that the possibilities of paludrine for the chemotherapeutic control of malaria in non-immune Europeans and indigenous native populations with premunity call for further critical field experiments on a substantial scale.

In the discussion which followed WENYON drew attention to F.'s previous conclusions that the difference between the malignant tertian parasite and the benign tertian parasite from the standpoint of persistence of infections could be best explained on the basis of differences in endothelial development.—C. HORTON SMITH.

GREEN, H. H., RASMUSSEN, A. F., Jr., & SMADEL, J. E. (1946.) **Chemoprophylaxis of experimental influenza infections in eggs.**—*Publ. Hlth Rep., Wash.* 61. 1401-1403. [Authors' summary copied *verbatim*.] 1856

Nitroakridin 3582 has an inhibitory effect on the growth of influenza B virus in embryonated eggs. This effect is most apparent when small virus inocula are employed.

MONTGOMERY, S. A. (1947.) **Antibiotics and canine distemper.** [Correspondence.]—*Brit. med. J.* Jan. 11th. 73. 1857

A wire-haired terrier developed distemper complicated with bronchitis of a severe type.



Adequate sulphonamide therapy had been given for about one week with little apparent benefit. 200,000 units of the sodium salt of penicillin were then injected intramuscularly. Within 12 hours the temperature fell from 105°F. to 102°F. and after a second dose of 200,000 units given 24 hours later it fell to normal, 100°F., and the animal recovered completely. Whether the result was due to action on the virus infection or on secondary invaders was not ascertained.—E. M. J.

CHEBOTAREV, R. S., ARKHIPOV, V. V., & KOLOSKOVA, V. R. (1945.) Ispytanie fenotiazina v bor'be s parazitarnymi boleznyami zhivotnykh. [Experiments with phenothiazine in the control of parasitic diseases in animals.]—*Veterinariya, Moscow*. No. 6. pp. 14-17. 1958

Trials of phenothiazine against the various parasites of different farm animals, resulted in the following conclusions:—

Phenothiazine is very effective against *Parascaris* and strongylids in foals and horses, but larvae of strongylids that have penetrated the gastric mucosa or are situated in the perinephric tissue or outside the peritoneum are immune to the largest doses. The drug is only moderately effective against *Oxyuris* (*Enterobius*) in foals and is ineffective against oestrid larvae and *Setaria* and *Onchocera* spp.

The question of dosage, together with the symptoms and pathology of phenothiazine poisoning in the horse, are discussed in detail. In cattle and sheep, 100% disinfestation was obtained against strongylids with a single dose. Although phenothiazine is reputed to have no action against fascioliasis, its administration produced very beneficial effects in such infestations. This is attributed to the action of phenothiazine breakdown products on the parasite in the bile duct. In rabbits, coccidiosis was successfully treated by 3-5 daily administrations of 1-2 g. phenothiazine per kg. live weight.—L. LEVENBOOK.

POTEMKINA, V. A. (1945.) Opyty terapii fastsiolēza krupnovo rogatova skota geksačklore-tanom. [Treatment of fascioliasis in cattle with hexachlorethane.]—*Veterinariya, Moscow*. No. 4/5. pp. 28-29. 1959

As a result of many experiments, single dosing with hexachlorethane at the rate of 0.4-0.8 g. per kg. body weight was recommended as treatment for bovine fascioliasis. Milk from cows so treated remained slightly tainted up to three days, the taint being removed by boiling. No other deleterious effects were observed.—L. LEVENBOOK.

ASENJO, C. F. (1944.) Recent advances in the field of enzymatic anthelmintics.—*Bol. Asoc. Méd. Puerto Rico*. 36. 215-219. [Abst. in *Helminth. Abstr.* 13. 25, copied *verbatim*.] 1860

Although vegetable enzymatic anthelmintics readily digest almost any species of intestinal parasite *in vitro* only a few are susceptible *in vivo*. The most effective are the milky exudates of several species of fig trees which have a specific action on the whipworm. Of other enzymatic anthelmintics, mention is made of papaya latex, pineapple juice, and maya juice, but there is still little exact knowledge concerning their clinical value.

ZOLLINGER, F. (1944.) Erfahrungen über die Behandlung der Gebärmutterverdringung des Rindes nach den Methoden von Schreiner-Auer, Seibert, Bach und Wegerer. Abänderungsvorschläge. [Treatment of uterine torsion in cows.] *Schweiz. Arch. Tierheilk.* 86. 245-253. 1861

Uterine torsion in cattle is very common and may extend to 90°, 180°, 270°, 360° or even to two complete revolutions (in the last two cases the os is completely occluded). Before correction is attempted, a very careful examination and accurate diagnosis of the existing position must be made. Rolling the animal and several methods of correction by means of external force applied to the foetus through the abdominal walls are described and critically analysed.—C. AHARONI.

SPÖRRI, H. (1946.) Physiologische Grundlagen der Follikelhormonmedikation. I. Mitteilung: Der Wirkungsmechanismus des Follikelhormons bei der Ovarialinsuffizienz. [Physiological basis of follicular hormone medication. I. Action of follicular hormone in ovarian insufficiency.]—*Schweiz. Arch. Tierheilk.* 88. 477-497. 1862

The sexual cycle is reviewed and various forms of ovarian insufficiency are discussed and classified. The primary cause can be either peripheral in the ovary or central in the pituitary-midbrain system. It is stated that the follicular hormone acts as a powerful central stimulant and is thus capable of stabilizing the sexual cycle; the hormone, it is said, is therefore of the greatest value in the treatment of sterility.—J. M. ROBSON.

HALL, K., & NEWTON, W. H. (1946.) The action of "relaxin" in the mouse.—*Lancet*. 250. 54-55. 1863

Separation of the mouse symphysis pubis in pregnancy is quantitatively too extensive and too rapid to be compared to that obtained on injecting spayed mice for long periods with generous doses of oestrogen. If oestrogen is the active agent, then in pregnancy an additional factor enhancing its effect is also present. Removal of the ovaries, but not of the pituitary, prevents the separation during pregnancy. When spayed mice are



injected with 1 ml. daily of pregnant rabbit serum in addition to a basal, but itself ineffective, dose of oestrogen, pubic separation of 2·3 mm. is observed after about a week. (Negative results are obtained with non-pregnant rabbit serum.)

In further experimental work it was shown that:—(1) Enlargement of the pubic gap as seen by X-ray examination in normal pregnancy, starts between the 18th and 14th days and then continues at a rate of about 1 mm. per day for about five days, (2) In spayed mice, daily subcutaneous injections of 1·6–25·0  $\mu$ g. oestrone in oil for ten days give an increase in pubic separation of  $0\cdot20 \pm 0\cdot14$  mm., the level of oestrone being insignificant; when 0·1 ml. daily of P.R.S. is given in addition from the third day of oestrone injection onwards, the increase of separation in ten days is  $0\cdot93 \pm 0\cdot52$  mm. (3) When the experiment is prolonged to 16 days, in mice receiving 6·4 or 25·0  $\mu$ g. oestrone alone there is an increase of  $0\cdot36 \pm 0\cdot2$  mm., while in mice receiving 1·6  $\mu$ g. oestrone + 0·1 ml. P.R.S., there is an increase in gap of  $1\cdot4 \pm 0\cdot6$  mm. The difference between means is significant. (4) Progesterone, in doses up to 1 mg. per day, does not enhance the action of oestrone in spayed mice, and when it is used to maintain pregnancy in mice spayed during gestation, with or without added oestrone, the symphysis remains closed. (5) Spayed oestrone-primed mice, after eight daily injections of 0·2 ml. of an extract of P.R.S. develop an average pubic gap of  $4\cdot33 \pm 0\cdot6$  mm., thus approaching the normal rate of separation.

The authors believe that pubic separation in the mouse may furnish a delicate objective test for relaxin, which, they believe, is a physiological entity.—H. PAVER.

RYAN, F. J., BALLENTINE, R., SCHNEIDER, L. K., STOLOVY, E., CORSON, M. E., & RYAN, E. J. (1946.) The use of antibiotics, vitamin analogues and other compounds in experimental gas gangrene.—*J. infect. Dis.* 78. 223–231. 1864

Wounds in mice infected with strains of *Cl. welchii*, *Cl. septicum*, *Cl. novzi*, *Cl. histolyticum* and *Cl. sordellii* were treated with a single local application of various substances. New compounds, chemically related to important bacterial metabolites (nicotinic acid, pantothenic acid, biotin, etc.) were without effect, as were a variety of peroxides. Sulphadiazine and sulphathiazole administration produced an increased survival of mice infected with *Cl. welchii*, but not other clostridia. Penicillin was effective against all gas gangrene organisms except *Cl. novzi*. Effects were also produced by streptothricin against *Cl. welchii* and *Cl. histolyticum* and by streptomycin against *Cl. welchii*.—J. M. ROBSON.

MORLEY, D. C. (1945.) A simple method of testing the sensitivity of wound bacteria to penicillin and sulphathiazole by the use of impregnated blotting paper discs.—*J. Path. Bact.* 57. 379–382. 1865

Dry blotting paper discs, 12 mm. in diameter and impregnated with penicillin before drying, were found to retain their activity when stored in the refrigerator or at room temperature in sealed desiccator pots for periods up to five weeks. In making routine cultures from wounds, the swab is streaked on to a blood agar plate and a penicillin disc is placed so as to include both crowded and sparse areas of the plate. After incubation, penicillin-sensitive bacteria are absent from a zone about 1 cm. wide around the disc.

Blotting paper discs of a different colour (ordinary commercial blotting paper) were impregnated with sulphathiazole (0·04 ml. of a 0·25% solution in broth), dried at 37°C. and stored in sterile screw-capped pots. Zones of inhibition around the discs placed on inoculated blood agar plates are of significance in that some strains isolated from wounds showed definite sensitivity. The implications of negative results were not studied.—E. G. WHITE.

HUGHES, D. L., & EDWARDS, S. J. (1946.) The *in vitro* action of disinfectants and the application of CTAB in the control of *Str. agalactiae* mastitis.—*J. Hyg. Camb.* 44. 442–450. 1866

The experiments reported in this paper compare the potencies of several disinfectants which might be used for the destruction of *Str. agalactiae* in cases of bovine mastitis.

The six preparations tested contained chlorine as the active principle, *viz.* chlorox, deosan and milton, dettol and supersan (two chloroxylenol solutions) and CTAB (cetyl-trimethyl-ammonium-bromide). Their efficiency was tested at various dilutions against calculated numbers of *Str. agalactiae* by a modification of the Rideal-Walker technique, in which the number of viable organisms remaining after contact with the disinfectant was estimated in roll tubes, using blood agar as the medium.

In the preliminary tests, chlorox, milton, deosan and CTAB were found to be lethal to *Str. agalactiae* in dilutions ranging from 1:100 to 1:1,000 after contact lasting 30 sec. Dettol and supersan were effective after 1 min. in dilutions of 1:200 and 1:500 respectively. Further tests showed that the end points of the chlorine disinfectants were about the same, being lethal at dilutions of 1:27,000 after 30 sec. contact. In this test, the superiority of CTAB was shown, since a dilution of 1:81,000 of a 7·5% solution was effective. The phenol coefficient of crude CTAB was estimated at about 105,800.



Fourteen strains of *Str. agalactiae* were tested against dilutions of CTAB (7.5%) in broth ranging from 1:500 to 1:2,560,000 and 11 were destroyed in dilutions of 1:40,000 to 1:80,000 following incubation for 36 hours.

It was found, however, that the potency of CTAB was somewhat reduced in the presence of tap water to which had been added 10% milk.

As a skin disinfectant, CTAB was active against *Str. agalactiae* on the dry hand and on the cow's teat for at least three hours.

Having established the superiority of CTAB as a disinfectant against *Str. agalactiae*, the authors next attempted to control the spread of infection in a dairy herd. Udders were first cleansed with sterile cloths. CTAB cream was smeared liberally upon the hands of milkers and upon cow's teats after milking. This was continued for over two months, during which time the spread of *Str. agalactiae* appeared to have been reduced. After three months, however, lesions developed upon the teats and a rapid increase in the infection rate of teats and milk occurred.

It is suggested that the increase in teat lesions was due, at least in part, to the use of CTAB.

—J. C. BUXTON.

DE LOUREIRO, J. A., & LITO, E. (1946.) **Quantitative study of the sterilization of bacteria by mercuric compounds.**—*J. Hyg., Camb.* **44**. 463-470. [Authors' summary copied *verbatim*.] **1987**

In the present work it is suggested that the sterilization of bacterial suspensions by mercurial antiseptics is a reflexion of a possible stoichiometrical relation between the mercuric compound and the thiol receptors in the bacterial cells.

See also *absts.* **1714** (antibiotic from *B. subtilis*); **1729** (quinacrine for coccidiosis); **1760** (dips to control itch-mites); **1912** (the chemistry of anaesthesia).

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

LEVOWITZ, D. (1946.) **The origin and control of thermoduric organisms. Some fundamental phases.**—*Rep. N.Y. St. Ass. Milk Sanit., 1945*. pp. 219-235. Discussion pp. 235-236. **1870**

Thermoduric bacteria may be defined as organisms which are not destroyed completely by exposure to either of the two usual pasteurizing processes. The whole position is reviewed and the control of these organisms is described, with especial reference to the standards of cleanliness generally accepted in the U.S.A.

Thermoduric organisms are normally found in aseptically drawn milk and vary little from cow to cow; the health of the animal does not appear to exert any influence, but the general standard of dairy hygiene is reflected to a remarkable extent in the number present in market milk.

This has been verified experimentally by studying the times of survival of suspensions of *B. typhosum* mixed with multiples and sub-multiples of the quantity of antiseptic theoretically equivalent to the thiol content of the suspension, as estimated by iodometric titration.

The considerable differences observed in the time of survival of suspensions mixed respectively with more and with less than the thiol equivalent of antiseptic, and the absence of any marked effect of dilution of the mixture, show that there is a quantitative relationship between the amounts of substrate and the quantity of antiseptic capable of sterilizing it.

BYRNE, E. A. J. (1947.) **Effect of organic mercurial preparations on diseases of the skin.**—*Brit. med. J.* Jan. 18th. 90-92. **1868**

Phenyl mercuric chloride and phenyl mercuric acetate were used in 500 cases, most of them being mycotic infections (ringworm of trunk and limbs, epidermophytosis inguinale, epidermophytosis of feet). The concentration was 0.125% or less and the drug was applied in "eucerin" [5 parts of cholesterol from wool fat and 95 parts of paraffin] and water, in a calamine lotion, or in a simple solution in distilled water. The results were very satisfactory. No systemic toxic effects were seen but in some patients slight and temporary vesication occurred, mainly around the spreading edges of the skin lesions.—J. M. R.

FISCHER, E. K. (1944.) **Surface-active agents.**—*Soap Sanit. Chem.* **20**. No. 1. 28-31, 67 & 69. **1869**

F. describes tests for the wetting, spreading, emulsifying and dispersing qualities of various surface-active agents.—S. M. G.

The straining of milk is deprecated: it is much better to adopt clean methods of milking. The removal of fore-milk before milking decreases the number of colonies present to a considerable degree. The best method to keep milk below the standard of "certified milk" (500 colonies per ml.) is a clean method of production. Equipment should be rinsed directly after use with plenty of soft or softened water before the milk has had time to dry. Hard water promotes milk stone formation which is particularly favourable to the growth of thermoduric bacteria. The control of thermoduric organisms is essential to public interests. Enterotoxin formation may accompany low thermoduric as well as high thermoduric concentrations.—D. S. RABAGLIATI.

BUCHBINDER, L., & FERTIG, J. W. (1946.) **Pre-**

**liminary report on coliform studies of pasteurized milk and milk products.**—*Rep. N.Y. St. Ass. Milk Sanit.*, 1945. pp. 103-120. 1871

This is a progress report on the study of the coliform problem in pasteurized milk carried out in New York city. The study embraces such questions as the seasonal variation in the number of coliform organisms, the possible heat resistance of certain strains, the relative productivity of the recommended media and, most important, the standards attainable by the great majority of plants in the city. The data are presented briefly, the greatest emphasis being placed on standards.

The tentative conclusion is reached that when coliform organisms are found in pasteurized milk, this is not because they have resisted heat-treatment. It was found that most supplies contained coliform organisms, if only a large enough sample were examined, although they were sometimes present in very small numbers only. This was especially true in hot weather. It was found that as a general rule there was a relationship between the number of coliform organisms found in pasteurized milk in individual dairies in summer and winter.

It is recognized that any standard of cleanliness must be arbitrary: a defect of most standards is their fixed dividing line and the intrinsic statistical uncertainty of whatever figure is obtained. It is proposed, therefore, that for whatever standard is chosen, a zone of indecision be designated. The proposal of two different seasonal standards, each with a zone of grace, for pasteurized milk will be tested out in New York city for a one-year period.—D. S. RABAGLIATI.

DUBOIS, A. S., & DIBBLEE, D. D. (1946.) **The influence of surface active cationic germicides on the bacterial population of milk.**—*J. Milk Technol.* 9. 260-268. [Authors' summary copied *verbatim*.] 1872

Alkyl dimethyl benzyl ammonium chloride is shown to lack any influence on the bacterial counts of raw or pasteurized milk, at concentrations ranging from 1:500 and 1:25000. The higher concentrations have an inhibitory effect on the growth of gram-positive acid-producing organisms, but not on that of gram-negative ones. The lower concentrations do not have such an effect.

A chemical method for the estimation of surface active cationic germicides in milk is described, as well as a qualitative test for their detection in solutions.

SFORZA, M. (1944.) **La Centrale del Latte di Asmara nel primo biennio di attività. [The first two years' service of the Asmara milk-centre.]**—*Boll. Soc. ital. Med. Ig. trop. (Ses. Eritrea), Asmara.* 4. No. 1. 8-49. [Part of

abst. in *Bull. Hyg., Lond.* 20. 220, copied *verbatim*. Signed: H. HAROLD SCOTT.] 1873

The Asmara milk-centre did good work in the first two years of its existence. The idea was first mooted on July 1st, 1941, but the next six months were spent in matters of a tentative and experimental nature, so that the scheme did not begin to function properly till the beginning of 1942. Much of this long paper is taken up with matters of general knowledge having only indirect bearing on the actual project. Thus, the opening sections deal with the importance of milk as food, the need for healthy cows, the meaning, objects and methods of pasteurization. The author then gives an account of the procedure adopted at Asmara, but in general terms only. When the milk is brought to the Centre it is inspected and subjected to examinations for fat content, for bacteria qualitatively and quantitatively, and for leucocyte content; examinations are made again after pasteurization.

SEELEY, H. W., Jr., ANDERSON, E. O., & PLASTRIDGE, W. N. (1945.) **Mastitis and the plate count of milk. VI. The contribution of staphylococcal mastitis to the standard plate count of milk, and some cultural characteristics of the organisms isolated.**—*J. Milk Technol.* 8. 259-263. [For part V, see *V.B.* 16. 386.] 1874

Plate counts from 80 quarters affected with chronic staphylococcal mastitis ranged from 200-42,000 staphylococci per ml. Milk from two quarters affected with acute mastitis yielded up to 58 million colonies per ml. Examinations of 289 strains of staphylococci isolated from the affected quarters showed that 72% were coagulase-positive (strains isolated from five normal milk samples were uniformly coagulase-negative) and 36% haemolytic and that 44% produced yellow pigment in varying degrees.

As was to be expected, there was no correlation between the leucocyte counts and the corresponding plate counts of the samples examined. The brom-thymol-blue test detected only 35% of the cases of mastitis concerned.

Generally speaking, it may be said that under average farm conditions, bacteria from extraneous sources will contribute more to the plate count than will staphylococci present in the milk as it comes from the udder. Difficulty in meeting plate count requirements may be encountered when there is widespread infection in a herd and when the total volume of milk from the affected quarters is high.—I. W. JENNINGS.

VAN OIJEN, C. F. (1940.) **Richtlijnen voor het bacteriologisch onderzoek van slachtdieren. [Rules for the bacteriological investigation of**



slaughter stock.]—*Tijdschr. Diergeneesk.* 67. 1059–1073. Discussion pp. 1073–1075. 1875

The author considers the term "inspection of slaughter stock" more appropriate than "meat inspection" and defines it as the inspection and estimation of slaughter animals for their suitability for human consumption. Veterinary surgeons should be entrusted with the duties of inspection.

Inspection should consist of (1) *ante-mortem* clinical examination, (2) the examination of the carcass and organs for pathological lesions and (3) the bacteriological examination. The clinical examination is most important, but is not possible in cases of emergency slaughter.

The importance of conducting the examination on these lines is discussed and it is noted that clinical symptoms indicate the desirability or otherwise of carrying out a bacteriological examination. It is now recognized that in cases of acute salmonellosis, especially in adult cattle and in older calves, there may be severe clinical symptoms without significant pathological lesions. Conditions in which a bacteriological examination is essential are foot and mouth disease, Johne's disease, grass tetany, septicaemias, toxæmias, pyæmias, degenerative changes in the liver, kidneys and spleen, serious cases of mastitis, peritonitis following perforation of abdominal organs, traumatic pericarditis, haemoglobinuria, retention of the placenta and puerperal paresis. These conditions may be complicated by infection by salmonella and other organisms which affect the keeping qualities, the colour and the consistency of the meat.

The culture media required for the bacteriological examination are considered. The use of special media is not considered necessary until the presence of suspicious looking colonies is detected on the agar plates. The detection of pathogenic and ordinary anaerobes of putrefaction impairing the keeping qualities, etc., of meat is referred to briefly. The author considers that attempts should be made to improve the present methods of bacteriological inspection. He maintains that it is better to perform bacteriological examinations too often than too seldom.

In the discussion which followed, CLARENBURG stated that not only the spleen, kidneys and sometimes lymph nodes, but also the liver must be examined, especially when salmonellosis is suspected. The author points out that according to the meat inspection regulations the musculature should not necessarily be considered infected if saprophytes are encountered in the kidneys and liver. He notes that the low bacterial content of organs does not warrant the use of Muller's medium, in which the nutrient material is only ordinary bouillon.—P. L. LE ROUX.

OLT. (1943.) Beurteilung des Wildes in Handel und Verkehr. [Game animal inspection.]—*Z. Fleisch- u. Milchhyg.* 53. 111–113, 122–125 & 135–138. 1876

The methods usually adopted in dressing for sale the carcasses of various classes of game are briefly described. Quick cooling is necessary, as game which has been shot undergoes putrefaction very rapidly. Many disease conditions which may affect the suitability of the carcass for human food are mentioned.

Red deer affected with favus of the skin may be passed for human consumption. Chamois and wild boar badly affected with mange are unsuitable. Hares with malignant eczema due to *Str. pyogenes* may be passed if the lesions are confined to the head parts, but should be condemned when there is nasal discharge or abscesses in the neck or testicles. Blow fly maggots are destroyed when meat is held for two days in cold storage and carcasses with mild infestations may be passed. Moulds may grow on dry venison, but such venison may be used after the mould has been washed off.

Red deer, chamois, hare and rabbits affected with cysts of the tapeworms *C. tenuicollis* and *C. pisiformis* may be passed. *C. echinococcus* and *C. cellulosae* cysts seldom occur in game. Wild boar and badger carcasses must be examined for trichinosis. Lungworms occur in roe deer, fallow deer and red deer. Haemorrhagic septicaemia caused heavy loss in wild boar and red deer in 1878 in Germany, but is now seldom seen. Tularaemia occurs in hares and is recognized by swelling of the mesenteric lymph nodes.

The examination of carcasses for gunshot wounds by X ray and other methods in criminal proceedings against poachers is discussed. Trapping by snares and steel traps is prohibited in Germany and the signs by which trapped carcasses may be recognized are described.—P. SASSE.

DOYLE, H. S. (1946.) An outbreak of food poisoning in Prince Albert, Saskatchewan.—*Canad. J. publ. Hlth.* 37. 65–68. [Abst. from author's summary.] 1877

An outbreak of food poisoning is described which would appear to be due to contamination of a food by staphylococcus. Thirty-eight cases and 27 controls were investigated.

— (1945.) Se modifican disposiciones del reglamento de importacion y exportacion. [Uruguay: Decree of December 12th, 1944, concerning the import and export of animals.]—*Bol. mens. Direcc. Ganad., Montevideo.* 28. 19–20. 1878

This decree permits the export of cattle from Uruguay to Brazil, as the result of a treaty between

those countries. Only bulls over three and cows over six years old may be exported and of these, not more than 200,000 per annum. Exporters must consult the Regional Veterinary Officer who will examine the animals, mark them and issue

certificates of health and origin. Customs duty is abolished, but exporters must bear the veterinary expenses. Only certain ports may be used for shipping.—R. MACGREGOR.

See also absts. 1694 (staphylococci in milk) 1746 (poliomyelitis virus in sewage); 1834 (adulteration of milk with colostrum); 1911 (clean milk).

## ZOOTECHNY

LOVEDAY, R. K. (1946.) **The transport of animals by sea between South Africa and India during World War II.**—*J. S. Afr. vet. med. Ass.* 17. 69–80. 1879

An interesting account is given of the shipment of 38,151 animals from South Africa to India during the war. These included 22,016 mules, 10,022 donkeys, 3,527 horses, 323 bovines, 2,259 pigs, one zebra and three goats, all of which were carried between August, 1942, and September, 1945. Apart from one ship lost through enemy action with 737 animals on board, the death rate was very small, varying from 0.46% for the donkeys to 0.31% for the cattle.

A description is given of the preparation of the animals before shipping, the methods of feeding and the daily routine on board ship, and a note on the veterinary service is appended. At first all the animals were embarked without inoculation against horse sickness, but later on, as the result of an outbreak, all equines, including donkeys, were inoculated.

"In view of the fact that about 40,000 equines were exported to India, some fully susceptible to horse sickness, and others having varying degrees of immunity, it would be reasonable to assume that if any danger of the introduction of horse sickness into India by the export of equines exists at all, it is not a great one and should therefore not be a deterrent in the export of equines to that country in peace time."

—D. S. RABAGLIATI.

ROSENTHAL, W., & ORTEGA, J. A. (1945.) El efecto de la alcalinidad sobre las soluciones garrapaticidas arsenicales y sobre su accion. [The effect of alkalinity on arsenical acaricidal dips.]—*Cuad. verd. 3a. Conf. interamer. Agric., Caracas*. No. 36. pp. 27–30. 1880

An increase in the alkalinity of sheep dips through repeated adjustments causes flocculation of the soap, with resulting lowering of the wetting power, and also increases the oxidation of arsenic. If the alkalinity reaches that of 0.2 N solution of sodium hydroxide, the dip will have an irritant effect on the skin. This is not in itself dangerous, but allows increased absorption of arsenic, which may cause poisoning in young animals. An efficient dip should not be more alkaline than

0.04–0.08 N sodium hydroxide; otherwise it should be adjusted by the addition of the requisite amount of concentrated sulphuric acid.—I. W. J.

FRENCH, M. H. (1946.) **Notes on the hides and skins industry.**—*E. Afr. agric. J.* 12. 128–133. 1881

The factors which affect the quality of hides and skins are discussed with regard to the variations which occur in different parts of the same hide and as a result of sex, age, nutritional state, season of the year and miscellaneous factors. This is followed by a consideration of the factors which influence the grading of hides and skins.

—M. C.

GRÜTTNER, F. (1942–43.) Über das Verhältnis des Gewichtes der Haut zum Lebendgewicht bei Rindern der Niederungsrassen. [Relation of the weight of the skin to the live weight of cattle of the Niederung breed.]—*Z. Fleisch- u. Milchhyg.* 53. 26–28, 35–36, 46–47, 57–59, 65–68 & 94–95. [For conclusion of article, see *V. B.* 15. 163.] 1882

These articles contain a comprehensive statistical analysis of the relation of skin weight to live weight of Niederung cattle. 1,764 animals were examined in the abattoir and the percentage weight of skin to body for different grades, sex and age are given.—C. W. OTTAWAY.

TRAUTMANN, A., & FINK, K. (1944.) Zur Frage der Kastration in der Nutriazucht. [The problem of castration in nutria breeding.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 359–361. 1883

As in most branches of animal husbandry, castration is advantageous in nutria farming. This article deals with anatomy. In male nutria, the testes are abdominal, but pass freely through broad inguinal canals into scrotal cavities lying alongside the penis. These cavities lie deep under the skin and do not protrude as a scrotum even when filled.

It is stated that, in spite of this anatomical arrangement, castration can be performed with reliability, but the technique is not described, as it is intended for publication later.—J. E.

See also absts. 1793 (artificial insemination); 1828–1832 (reactions of animals to high temperatures).



## TECHNIQUE AND APPARATUS

CAMERON, G. M., & CASTLES, R. (1945.) **Clorox digestion. A comparison of clorox digestion and three other methods for finding acid-fast organisms in sputum.**—*Amer. Rev. Tuberc.* 52. 530-533. [Spanish summary.] 1884

Several hundred samples of human sputa were examined in order to assess which of four different methods of pre-treatment of the material was most successful in revealing the presence of tubercle bacilli in stained films. The films were prepared either directly from the sample or after the latter had been treated with sodium hydroxide, by autoclaving or by clorox digestion. [Clorox, a bleach, deodorizer and disinfectant contains as its active ingredient 5.25% NaOCl.] Clorox digestion was the best of the four methods as it detected 94% of the positive samples as compared with autoclaving (88%), sodium hydroxide (79%) and direct smear (62%).

The efficiency of clorox digestion for digesting sputum and concentrating the organisms was emphasized by the fact that as compared with the other methods scanty organisms were most readily detected and also a positive diagnosis could be made after examination of the fewest number of fields.

It is pointed out that the method gives a microscopic field which is free of interference from extraneous matter. Material which has been treated by the clorox digestion method is not suitable for animal inoculation or culture.—J. K.

HAUDUROY, P., & POSTERNAK, J. (1942.) **Les applications bactériologiques de la microscopie en fluorescence.** [Fluorescence microscopy.]—*Schweiz. Z. Path. Bakt.* 5. 240-263. [In French.] 1885

This article, which reviews the principles of fluorescence microscopy, does not lend itself to detailed abstraction. The manipulation of the special microscope and the ancillary apparatus are fully described and the relative values of various dyes used to produce fluorescence are discussed.

The authors examined a series of human sputa from various sources. When direct examination was negative for acid-fast bacilli the specimen was homogenized with alkali and examined (a) after staining by the usual Ziehl-Neelsen method and (b) by fluorescence microscopy. In a series of 81 sputa, 11 were positive by method (a) and 15 by method (b). In the opinion of the authors the bacilli are more readily recognized by the fluorescence method; moreover, time is saved because a lower power ocular can be used. —R. E. G.

FELDMAN, H. A. (1946.) **Centrifuged agglutination reactions for serum diagnosis and bacterial**

**identification.**—*Amer. J. clin. Path. Tech.* Sect. 16. No. 1. 25-30. 1886

The use of centrifugation in agglutination tests is described for work on reactions to *S. typhi*, *S. paratyphi*, *Br. abortus*, *Past. tularensis* and *Proteus*. The agglutination reactions are sensitive, specific and easily read. The serum, in a single moderately strong dilution, is first tested against standard antigen, as a guide to the subsequent measurement of its full titre of antibody. The mixture of serum and antigen is made up in a total volume of 1 ml. The tubes are centrifuged at 2,000 r.p.m. for 7 min. The results are immediately read in terms of the degree of visible clumping. Standard agglutinating sera can be used in the same way for the purpose of typing unknown organisms.—J. KEPPIE.

LACORTE, J. G., CARDOSO, H. T., & SANTOS, M. (1944.) **Estudos sobre o pneumococo. Ia. nota—Experiência sobre a produção de peróxido pelo pneumococo e reação para evidenciá-la.** [Studies on the pneumococcus. I. Experimental evidence of the production of hydrogen peroxide by the pneumococcus and a test for detecting peroxide.]—*Mem. Inst. Osw. Cruz*, 41. 351. [In English, p. 352.] 1887

LACORTE, J. G., & SANTOS, M. (1944.) **Estudos sobre o pneumococo. IIa. nota—Relação entre a virulência do pneumococo, a sua lisibilidade pela bile e a capacidade de formar peróxido. 3a. nota—Influência da mucina no metabolismo do pneumococo. 4a. nota—Influência do pH do meio sobre a formação da cápsula pelo pneumococo.** [Studies on the pneumococcus. II. Relation between virulence of the pneumococcus, its lysis by bile and its capacity to form peroxide. III. Influence of mucin on the metabolism of the pneumococcus. IV. Influence of the pH of the medium on capsule formation of the pneumococcus.]—*Ibid.* 353-354, 447-449 & 453-454. [In English, pp. 354, 449-451 & 454-455.] 1888

I. Hydrogen peroxide production is a constant characteristic of recently isolated strains of the pneumococcus. The authors describe a test for the detection of  $H_2O_2$  in culture. Strains of the organism are incubated at 37°C. for 18 hours in Cotoni's liquid medium. Ten drops of fresh 10% potassium iodide solution are added, followed by the same amount of normal hydrochloric acid. Chloroform [amount not stated] is added immediately and the mixture shaken. A rosy colour indicates the presence of  $H_2O_2$ . The addition of starch solution makes the mixture darken, owing to the liberation of free iodine.

The authors find that the test detects peroxide

production only with virulent strains. They have examined pneumococcus Types 1-27 (from the U.S.A.) and also 18 recently isolated strains of human origin.

II. Bile solubility of the pneumococcus is supposed to be enzymatic in nature, but pneumococcal cultures produce hydrogen peroxide, which is anti-enzymatic in nature. Investigating this apparent anomaly, the authors find that bile-soluble and peroxide-producing strains are virulent for mice, but strains which are not bile-soluble and which do not produce peroxide are avirulent for mice. Strains which are non-bile-soluble and which produce only small amounts of hydrogen peroxide are only slightly virulent for mice.

III. The ability of pneumococcal cultures to produce methaemoglobin from rabbit, sheep or horse red blood cells is considered to be the result of hydrogen peroxide production by the organisms. Mucin is an important factor in peroxide production. The addition of this substance to blood agar augments the formation of methaemoglobin and of peroxide by the pneumococcus.

Clinically, therefore, in cases of pneumonia, the increase of bronchial secretion, which contains a large amount of mucin, must favour the metabolism of the pneumococcus, allowing it to produce much peroxide by the splitting of haemoglobin, and thus paving the way for further multiplication.

IV. The pneumococcus does not lose its capsule-forming ability in an acid medium. Mucin is produced by the organism for the capsule, but it is dissolved in the medium by the acidity. The authors believe that capsule formation is a constant characteristic of the pneumococcus, and that the absence of a capsule is due, not to any change in the organism itself, but to the chemical properties of mucin, mainly its solubility in acid.

—ISOBEL W. JENNINGS.

TARAN, A. (1946.) **Laboratory methods. A simple method for performing a Wassermann test on anticomplementary serum.**—*J. Lab. clin. Med.* 31. 1037-1039. [Author's summary and conclusions copied *verbatim*.] 1889

A simple procedure has been given which permits the performance of a Wassermann test on anticomplementary serum and which eliminates the necessity of taking further specimens of blood from the patient. The procedure is based on the saturation of the serum with undiluted complement to satisfy the "fixing" properties of the serum. The excess complement is then destroyed, and a Wassermann test is performed in the usual manner. In all cases complete hemolysis was present in the control tube, and the tests were reported as negative, doubtful, and positive.

Known negative and positive serums were treated in the same manner as the anticomplement-

ary serums in order to check on the effects of complement saturation. The results of these tests were the same with and without complement saturation. There was excellent correlation between the Wassermann test on anticomplementary serum and the repeated Wassermann test on fresh serum and the Kahn test.

BUCHERER, H. (1943.) **Experimentelle Untersuchungen über die Fluoreszenzfärbung toter und lebender Bakterien nach Strugger. [Experimental studies on the fluorescent staining of living and dead bacteria by Strugger's method.]—Zbl. Bakt. II. 106. 81-88. 1890**

B. re-examined the work of STRUGGER [see *V. B.* 14. 75] on fluorescent staining with acridine-orange. In concentrations of 1:10,000 to 1:100,000 and of 1:500 to 1:1,000, the colours were green and red respectively. He also found that living protoplasm could take up only small quantities of the stain and fluoresced green, whereas dead protoplasm fluoresced red. He concluded that with this stain, using a suitable technique, it was possible to distinguish between living and dead micro-organisms. Ordinary smears could not be used, as even in unfixed preparations all organisms showed red fluorescence; the organisms had to be suspended in a drop of the stain solution 1:10,000, covered with a cover-slip and then read. He concluded, moreover, that the organisms die off during the process of drying on the slide.

In the present investigation, carried out with several species of *Sarcina* and a *Pedococcus*, it was found that not only could good growth be obtained from dried unfixed smears, but that even after staining with acridine-orange, preparations that fluoresced red throughout were viable on cultivation. Whether organisms showed red or green fluorescence depended mainly on the size of the bacterial inoculum relative to the volume and concentration of the stain solution. With increasing size of inoculum the fluorescence shifted from red to green, even when dead bacteria were present; a very small number of organisms with a large drop of stain gave red fluorescence for viable organisms. This explains why dried smears in which the volume of stain used is comparatively large show red fluorescence. If similar smears were covered with only a tiny drop of stain and then with a cover slip they appeared green.—A. MAYR-HARTING.

BULLOUGH, W. S. (1946.) **Agar technique for arresting movement in protozoa.**—*Science.* 104. 227. 1891

To overcome the difficulties of examining active Mastigophora and Infusoria under high powers of the microscope, B. uses a modification



of a technique used for the study of developing *Fucus* eggs and the development of amphibian embryos. A small drop of the protozoan culture solution is dropped on to a slide and over this is placed a cover glass carrying a similarly sized drop of agar (1% aqueous solution kept liquid at 40°C. in a water bath). As the culture solution and agar mix, the agar rapidly cools and the mixture becomes solid. The jelly so formed contains numbers of small water spaces in which the protozoa are confined. Large species are held tightly, but the smaller ones are able to swim about. By increasing the amount of agar relative to culture solution, or by using a 1.5% agar solution, the protozoa can be held more tightly. Protozoa will remain alive for an interval sufficiently long to enable the studies to be made. The agar must be made up in sea water for marine protozoa and in normal saline for other protozoa.—C. HORTON SMITH.

LAMOUNIER, R. D., & DE CARVALHO PEREIRA, P. (1945.) Observações preliminares sobre a hemossedimentação em bovinos pelo método de Westergren. [Blood sedimentation rate in cattle determined by Westergren's method.]—*Ref. Fac. Med. vet. S. Paulo*. 3. 159-164. [English summary slightly amended.] 1892

In preliminary tests the authors found that bovine blood had a sedimentation time of 1-3 min., as estimated by Westergren's apparatus. When sedimentation was begun six hours after collection, there was no change in the result, as read after 24 hours. The sedimentation rate was slower in pregnancy and in some diseases and was influenced by the administration of a hypertonic solution of glucose before blood was collected.

HYNES, M., & LEHMANN, H. (1946.) The accuracy of haemoglobin determination by the copper sulphate-blood gravity method in Indian soldiers.—*J. Physiol.* 104. 305-311. 1893

A drop of plasma or whole blood when placed in a solution of copper sulphate of known specific gravity becomes encased in a sack of copper proteinate and the gravity of the drop is not changed for 15 sec. The rise or fall of this drop during the interval shows whether it is lighter or heavier than the solution. With a series of copper sulphate solutions with gravities graded at 0.001 intervals the gravity of the drop of blood can be determined to  $\pm 0.0002$ . The gravity of the plasma is directly related to the plasma protein content and haemoglobin can be calculated by assuming a normal value for plasma gravity or by measuring the plasma gravity and incorporating the figure in the equation. The latter method is more accurate but the authors found that by assuming a standard value for haemoglobin they

could calculate haemoglobin values for whole blood to  $\pm 1.5$  g. when haemoglobin was above 11 g. or to  $\pm 2$  g. when haemoglobin was below 10 g.

The method is useful when it is necessary to classify the blood of large numbers of individuals.—A. T. PHILLIPSON.

LATHROP, G. E. (1944.) Microtechnic of the pathologic eye.—*Amer. J. clin. Tech. Sect.* 14. 131-135. 1894

Kolmer's fluid is the fixative of choice. The maximum effects of dehydration must be obtained and celloidin embedding is essential.—L. M. M.

KARRAS. (1944.) Eine einfache Methode zur Demonstration von Herztönen in handelsüblichen Radiogeräten. [Demonstration of heart sounds of army horses by means of a simple adjustment to an ordinary wireless receiving set.]—*Z. Veterinärk.* 56. 304-308. 1895

An apparatus is described with the use of which it was possible for a lecturer to demonstrate heart sounds of horses to an audience. In addition to a common wireless receiving set, the following articles are required: a microphone from a field telephone, a telephone coil, two block condensers of 0.5 MF, a low-voltage battery, a microphone box, an oscillating membrane (celluloid or metal) and conducting wires. Full details, with illustrations, are given for the construction of the set and the method of use.

Details are also given of the construction of an electrical stethoscope for individual use, employing a torch battery, microphone and headphones.

[These instruments were designed by a German army officer during war time, when material was scarce and all the supplementary parts recommended were routine army issue; other commonly available electrical equipment could be used for this purpose.]—C. W. O.

NOWITZKI, E. (1944.) Der quantitative Nachweis organspezifischer Fermente und seine Bedeutung für die klinische Diagnostik. [The quantitative detection of organ-specific enzymes and its importance for clinical diagnosis.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 232-234. 1896

The excretion in the urine of enzymes having a specific action upon certain organs under pathological conditions was made the basis of a method which, it is stated, may be of diagnostic value. The substrates were minced, thoroughly washed and sterilized samples of various organs; the enzymes were prepared from urine by precipitating with acetone and taking up in physiological saline, the final volume being

one-half of that of the urine from which the preparation was made. Enzyme preparations and organ substrates were incubated at 37°C. for 20 hours. The product was filtered and a measured portion of the filtrate was incubated at 45°C. with ninhydrin. The time taken for a blue colour to develop was a measure of the concentration of an enzyme specific to the particular tissue under test, a short time indicating a high concentration of enzyme.

The following were uses of the method :—(a) In control of X-ray therapy, where damage to an organ was occurring, enzymes having a specific action on that tissue were released into the urine.

See also *abst.* 1697 (control of TB. in monkeys for experimental use).

## MISCELLANEOUS

LAUPRECHT, E. (1943.) Ueber Beziehungen zwischen Boden und Milchleistung. [**Relationship between soil and milk production.**]—*Züchtungskunde*. 18. 147–154. 1897

A study was made in 1937 of the relationship between milk yield and fat content of cows on various types of soil in East Friesland and North-West Oldenburg.

The soil types were moorland and marsh, with sandy soils at higher elevations. The marsh lands were of two kinds, comparatively recently reclaimed land and old marshes. The moorlands comprised high moors and low lying moors.

Average milk production per cow was highest on the reclaimed marshes, being 4,000 kg. On the older marshes the average was lower, but there were considerable variations in different areas. In some of the higher moor areas, the average was below 3,000 kg.

The fat content was generally low. In only a few areas was it above 3.4%. On the greater part of the reclaimed marshes it varied between 3.2 and 5.4%. On the moorlands, the average was between 3.0 and 3.2%, but on some of the high moors it was below 3%.

These variations may, in part, have been due to varying standards of management; in some cases they appeared to be related to the activity of cattle-breeding societies, but on the whole L. considers that soil types had a marked influence both on total yield and fat content.—P. SASSE.

SANZ EGAÑA, C. (1941.) Historia de la veterinaria española. Albeiteria — mariscaleria — veterinaria. [**History of veterinary medicine in Spain.**] pp. 493. Madrid: S. A. Espasa-Calpe. 17s. 6d. 1898

From a massive collection of early veterinary literature the author has compiled a history of man's care of animals in Spain from 1500 A.D. to 1900. Although there are references to earlier

It is stated that this method, like others, indicated sensitivity to X-rays in descending order, of liver, skin, udder, striped muscle. (b) In diseases of certain organs, both the site and the intensity of the trouble were indicated by the nature and amount of organ-specific enzymes. (c) In infective complaints, enzymes specific to many organs were detected and the way in which their concentrations varied at different stages of the disease was not the same for the various enzymes; complications affecting certain organs could be detected by increased enzyme activity before any clinical signs were apparent.

—R. MARSHALL.

works on the treatment of animal disease, veterinary history up to 1793 is really a history of farriery, which was first recognized as a profession at the beginning of the 16th century. There are many interesting excerpts from the literature of these times, including an account of blood transfusion (in 1717) for the purpose of "passing health from a sound animal to a sick one". The circulation of the blood was by that time recognized.

The history of the veterinary profession proper begins with the establishment of the Madrid Veterinary School in 1793, and all phases of the veterinarian's work for the next 100 years are described. There are chapters on the history of food inspection (meat inspection became compulsory in 1858), epizootology, the army veterinary service and the role of the veterinary surgeon in the bull ring. The chapter on veterinary periodical literature is a story of many veterinary journals of limited life.

Altogether this is a most comprehensive description of the development of veterinary work in Spain.—I. W. JENNINGS.

— (1945.) Estudio Veterinario de la Republica de Costa Rica. Trabajo efectuado por "Veterinary Survey Group Pan American Sanitary Bureau". [**Veterinary affairs in Costa Rica—a study made by the Veterinary Survey Group Pan American Sanitary Bureau.**]—*Rev. Agric., Costa Rica*. 17. 498–500 & 501–502. 1899

The cattle industry of Costa Rica is almost entirely a dairy industry. There is one veterinarian in the Government service and another in private practice.—H. G. ARAMBURU.

AASER, C. S. (1946.) Bilskyhet. [**Horses shying at automobiles.**]—*Maanedsskr. Dyrlaeg*. 58. 183–141. 1900

A. describes the general attitude in Norway to horses shying: Norwegian law favours horse owners and makes the owners of motor cars,



lorries, etc., liable to pay compensation after accidents.

The nature of shying and tests to find out whether a horse is liable to it are described,

together with the basis on which compensation is paid for horses killed or injured in collision with motor vehicles.—J. E.

## REPORTS

I. CANADA. (1941.) **Report of the Minister of Agriculture for the Dominion of Canada for the year ended March 31, 1941.** [GARDINER, J. G.] pp. 171. Items of veterinary interest pp. 14-16, 58-60, 78-80 & 112-116. Ottawa: E. Cloutier. 8vo. 50 cents. 1901

II. CANADA. (1942.) **Report of the Minister of Agriculture for the Dominion of Canada for the year ended March 31, 1942.** [GARDINER, J. G.] pp. 162. Items of veterinary interest pp. 15-17, 66-67, 81-82 & 107-110. Ottawa: E. Cloutier. 8vo. 50 cents. 1902

III. CANADA. (1943.) **Report of the Minister of Agriculture for the Dominion of Canada for the year ended March 31, 1943.** [GARDINER, J. G.] pp. 155. Items of veterinary interest pp. 12-15, 66-67 & 105-108. Ottawa: E. Cloutier. 8vo. 50 cents. 1903

IV. CANADA. (1944.) **Report of the Minister of Agriculture for the Dominion of Canada for the year ended March 31, 1944.** [GARDINER, J. G.] pp. 186. Items of veterinary interest pp. 16-20, 76-80 & 133-134. Ottawa: E. Cloutier. 8vo. 50 cents. 1904

V. CANADA. (1945.) **Report of the Minister of Agriculture for the Dominion of Canada for the year ended March 31, 1945.** [GARDINER, J. G.] pp. 212. Items of veterinary interest pp. 17-20, 73-77, 100-102 & 149-150. Ottawa: E. Cloutier. 8vo. 50 cents. 1905

I. DIVISION OF ANIMAL PATHOLOGY.—112,082 tests for BOVINE CONTAGIOUS ABORTION were made. Calfhood vaccination results indicated that the method could be safely employed.

All attempts to reproduce BOVINE CHRONIC HAEMATURIA failed and no further progress resulted from research work carried out on the aetiology of the disease. A great part of the unthriftiness and mortality among swine was considered to be due to preventable causes. Only a few sporadic cases of EQUINE ENCEPHALOMYELITIS occurred. An effective vaccine was available. Progress was made in the development of a safe and effective vaccine against DISTEMPER in ranch-raised foxes and mink. The vaccine afforded complete protection of experimental animals under laboratory conditions. PULLORUM DISEASE control is by removal of infected birds. Tube agglutination and the whole blood test are both used. Field trials have been conducted with an autogenous vaccine in controlling INFECTIOUS LARYNGO-

TRACHEITIS. Further research is in progress. Biological products produced included 1,941,944 doses of tuberculin, 23,364 doses of mallein, 1,430 doses of johnin, 10,610 ml. of DISTEMPER vaccine (fox and mink), 1,810 ml. of EQUINE ENCEPHALOMYELITIS vaccine, 760 ml. of *Br. abortus* vaccine, and 1,590 ml. of *Br. abortus* (concentrated) test antigen. Blood tests and specimens examined totalled 112,082 for BRUCELLOSIS, 28,155 for PULLORUM and 1,898 miscellaneous.

ANIMAL HUSBANDRY DIVISION.—All dairy cattle herds were free from TUBERCULOSIS, BRUCELLOSIS, CALF SCOURS and breeding troubles and nearly all were free of MASTITIS. The Clydesdale horses were improving in quality. Two of the foals died of JOINT ILL in spite of iodine feeding. In an investigation of the value of phenothiazine in the control of nodular worms, there was a reduction of 86.6% in the number of nodules in the intestines of treated sheep, as compared with the numbers found in untreated lambs in previous experiments. Ground millet replaced a portion of the barley in the ration of pigs without loss of efficiency or any appreciable difference in carcass quality. In the cattalo breeding experiment there were 75 females of varying percentage of buffalo and domestic cattle blood. Very few hybrid males were fertile. Artificial insemination had been demonstrated as a practical proposition to provide farmers with the service of a good bull for his best cows and so provide himself with a bull calf to raise for use in his own herd.

HEALTH OF ANIMALS DIVISION.—TUBERCULOSIS eradication work was much curtailed owing to shortage of staff. Cattle owners were assisted in controlling and eradicating BRUCELLOSIS. A small outbreak of RABIES occurred in Saskatchewan among hunting dogs from the U.S.A. There was no spread of the infection. There were no outbreaks of SHEEP SCAB. Few cases of SCABIES in horses and cattle were reported.

MEAT AND CANNED FOOD SECTION.—Ninety-two establishments were operating. Animals slaughtered totalled 1,603,274 cattle, 765,281 sheep, 5,884,677 pigs and 788,450 poultry. These figures represent increases in cattle and pigs and decreases in sheep and poultry slaughtered.

II. DIVISION OF ANIMAL PATHOLOGY.—Experimental treatment with colloidal silver oxide and with gramicidin gave some beneficial results against MASTITIS. 1,763,172 test doses of tuberculin, 760 doses of johnin and 19,428 doses of

mallein were issued. The agglutination blood serum and whole blood tests for PULLORUM DISEASE of poultry were carried out at Dominion and Provincial Government Laboratories. 149,718 blood tests for BOVINE CONTAGIOUS ABORTION were made. Experimental studies and field trials with *Br. abortus* strain 19 were in progress.

EQUINE ENCEPHALOMYELITIS and HUMAN ENCEPHALOMYELITIS occurring simultaneously in the Western Provinces received intensive investigation. The incidence and epidemiology were studied and various possible carriers were examined. Some evidence incriminated the ground squirrel (prairie gopher). The virus of E.E. was recovered from the spinal fluid of a man and systematic blood tests of human patients are being made. Study of the E.E. virus, the vaccines prepared from it and the immunological reaction to vaccination were being continued. DISTEMPER continued to cause heavy losses in young foxes and mink, adverse results following vaccination being attributed to faulty diagnosis of the diseases occurring and, in part, to the plurality of virus strains involved in outbreaks in foxes, mink, fitch and ferrets.

LYMPHOCYTIC CHORIOMENINGITIS virus was infective for man and animals. The virus was recovered from a child who died of a central nerve infection. It was often found in mice and had been recovered from DISTEMPER virus vaccine. Immunization experiments against INFECTIOUS LARYNGO-TRACHEITIS of poultry had been successful. Loss in growing pigs was found to be due to protein deficiency. An investigation was in progress on the losses caused among pigs by parasites, NUTRITIONAL ANAEMIA and other dietary deficiencies. Parasitic diseases diagnosed in sheep were VERMINOUS GASTRITIS, NODULAR DISEASE and AUTUMN DIARRHOEA. Phenothiazine was being used. In horses a study of the pharmacology and toxicology of phenothiazine was carried out and it was recommended that the drug should be used in relatively small doses under professional control.

ANIMAL HUSBANDRY DIVISION.—The satisfactory year with sheep was attributed mainly to the treatment of the sheep with phenothiazine and the reduction of nodular worm infestations and also to a planned cross-breeding programme which yielded thrifty rapidly growing lambs.

HEALTH OF ANIMALS DIVISION.—The contagious diseases section enforced the regulations for the control of contagious disease. There were very few cases of ANTHRAX. Considerable progress was made under the various TUBERCULOSIS eradication schemes, despite shortage of staff and other wartime handicaps. Interest in establishing herds free from BRUCELLOSIS was increasing.

Outbreaks of SWINE FEVER occurred in Nova Scotia, New Brunswick, Quebec, Ontario and Manitoba. There were no cases of GLANDERS, DOURINE, SHEEP SCAB, EQUINE MANGE or RABIES. Small outbreaks of CATTLE MANGE occurred in Nova Scotia and Ontario.

MEAT AND CANNED FOODS SECTION.—There were 93 establishments operating under the regulations. There were increases in numbers of animals slaughtered. Cattle slaughtered totalled 780,733 (11.06% increase), sheep 889,163 (9.65%), pigs 6,339,311 (7.17%) and poultry 1,113,213 (41.18%).

III. DIVISION OF ANIMAL PATHOLOGY.—Colloidal silver oxide and gramicidin did not prove successful in the treatment of BOVINE MASTITIS, particularly in old standing cases. Segregation of infected animals was the most important factor in the control of the disease in a herd. Johnin proved satisfactory when used experimentally for the diagnosis of JOHNE'S DISEASE. NECROTIC ENTERITIS of pigs caused heavy mortality in some parts of the country. Investigation was in progress as to the effect of nutritional disorders in aggravating the bacillary infection. There were wide-spread outbreaks of PULLORUM DISEASE. One factor which contributed to this is said to have been the existence of unusual strains which did not react with standard antigens. Strain 19 *Br. abortus* vaccine proved a valuable aid in controlling the BOVINE CONTAGIOUS ABORTION. 113,964 blood tests were made. Research to discover possible vectors of EQUINE ENCEPHALOMYELITIS was continued. An extensive survey of people in affected districts showed that about 20% had apparently had a sub-clinical attack. A strain of virus capable of producing TRANSMISSIBLE LEUCOSIS was established in chickens. Immunization experiments against INFECTIOUS LARYNGO-TRACHEITIS of poultry continued. A vaccine proved satisfactory under field conditions. Nutritional diseases were particularly important in young pigs. ANAEMIA of the young pig gave rise to stunting and death. Lack of animal protein was the most important factor in Western Canada in losses of pigs. In Eastern Canada NODULAR DISEASE and AUTUMN DIARRHOEA were eliminated when phenothiazine was used systematically in the treatment of flocks.

Biological products included 2,266,524 doses of tuberculin, 15,534 doses of mallein and 1,600 doses of johnin.

ANIMAL HUSBANDRY DIVISION.—Artificial insemination work with all of the experimental farm herd sires was being carried out in the herds of breeders in the district. A few cases of mineral and vitamin deficiency occurred during the winter. STRANGLES was a factor in reducing the number of



foals raised.

**HEALTH OF ANIMALS DIVISION.**—**TUBERCULOSIS** eradication work was carried on as vigorously as war conditions permitted. There was an increasing demand for the assistance under the scheme for eradicating **BOVINE CONTAGIOUS ABORTION**. An extensive outbreak of **SWINE FEVER** occurred in the county of Essex, Ontario. Other lesser outbreaks occurred in Ontario, Nova Scotia, Quebec and Manitoba. Control was by slaughter of affected and in-contact pigs, for which compensation was paid. Pigs on neighbouring farms were given **SWINE FEVER** antiserum. Cases of **RABIES** occurred in Ontario Province. Outbreaks of **CATTLE MANGE** occurred in Quebec and Ontario Provinces. There were no cases of **ANTHRAX**, **GLANDERS**, **DOURINE**, **SHEEP SCAB** or **HORSE MANGE**.

**MEAT AND CANNED FOODS SECTION.**—There were 91 establishments operating. Animals slaughtered totalled 1,568,886 cattle, 832,070 sheep, 6,140,614 pigs and 970,437 poultry. All these figures showed a decrease on the previous year.

**IV. DIVISION OF ANIMAL PATHOLOGY.**—The central laboratory and administrative offices are in Hull, Quebec. There are also branch laboratories at Saanichton, British Columbia, and at Lethbridge, Alberta; the third, at the Experimental Farm, Ottawa, specializes in the study of poultry diseases. The activities of the Division have been restricted by reductions in the staff through its members being drafted for service in the armed forces. The three sections of its activities are (a) research, (b) services, (c) manufacture of biological products. No drug tested proved of value in dealing with established cases of **MASTITIS**. Simple isolation of infected animals proved most successful in dealing with outbreaks. The early discovery of the infected animals was the main difficulty. Simple methods were not sufficiently accurate and a bacteriological examination took up too much time. **SWINE ERYSIPELAS** had become more widespread in Canada in recent years and was appearing in the acute form in some sections. Antiserum and drugs of the "sulpha" group did not prove of any value in the treatment of infected animals. Malnutrition did not appear to be a contributory cause of **NECROTIC ENTERITIS** of pigs. Strains of *Salmonella pullorum* which had varying antigenic composition affected the results of the tests. It was found that the house fly may act as a carrier of the organism, not only mechanically but also in its body where the organism can live for approximately five days. The importance of measures against **BOVINE CONTAGIOUS ABORTION** was stressed. The vaccines used merely

raised the resistance of animals: they did not produce a solid immunity. Conditions resembling **ACTINOMYCOSIS** of cattle caused considerable economic loss in Canada. An investigation showed that lesions resembling those of **ACTINOMYCOSIS** sometimes occurred in the tongues of cattle, being caused by foreign bodies gaining entrance to a normal depression of the tongue. Although **ENCEPHALOMYELITIS** in horses was controlled by the use of a vaccine, this had not proved to be satisfactory in outbreaks in man. Studies on the preparation of specific vaccines for **INFECTIOUS ANAEMIA** were in progress. The incidence of swine fever is less serious in Canada than in many countries because of the precautions taken to prevent its spread. The crystal violet vaccine used successfully in the U.S.A. did not produce an immunity in pigs vaccinated in Canada. Some experiments were made to investigate the possibility of the thorn-headed worm acting as a carrier of the disease. This parasite, which infests the intestines of pigs, passes part of its life cycle in the "June bug". A vaccine used experimentally gave an immunity of reasonable duration against **INFECTIOUS LARYNGOTRACHEITIS** of fowls. It was found that the symptoms of **CALF PNEUMONIA**, which is caused by a virus, closely resembled those of **SHIPPING FEVER**. So far no virus had been isolated from animals with **SHIPPING FEVER**. Field trials continue to demonstrate the usefulness of phenothiazine for the treatment of **NODULAR DISEASE**. The condition known as **BLACK SCOURS** in sheep is now stated to be due to some undetermined cause other than helminths. Red squill used as a raticide, proved contrary to previous theories, to be poisonous to pigs, but the bait containing the concentration of the drug was distasteful to them. Services undertaken included 143,943 brucella and 6,003 pullorum disease serological tests and 2,809 P.M. examinations.

**ANIMAL HUSBANDRY DIVISION.**—The activities of the division are briefly reviewed. An artificial insemination service with proven Holstein sires of the experimental herds was offered to private breeders. Work was continued on diagnosing poor fertility by examination of samples of semen and also on the effect of good nutrition on remedying partial sterility. \*

**HEALTH OF ANIMALS DIVISION.**—The contagious diseases section, which enforces the regulations to prevent and eradicate disease, reported that there were no outbreaks of **ANTHRAX**, **GLANDERS**, **DOURINE** or **SHEEP SCAB**. **TUBERCULOSIS** eradication work under the government schemes was well maintained, despite a shortage of veterinary inspectors. Assistance to owners in eradicating **BOVINE CONTAGIOUS ABORTION** is

provided under a voluntary agreement policy. An outbreak of RABIES at Windsor, Ontario, reported in 1948 was kept under control. There were a few cases of HORSE MANGE in three small outbreaks. Four small outbreaks of CATTLE MANGE occurred, two in New Brunswick and two in Ontario.

**MEAT AND CANNED FOODS SECTION.**—Ninety-five establishments were operated under the regulations. The total number of animals slaughtered was 1,711,176, cattle (9.07% increase), 949,888 sheep (14.15% increase), 8,395,503 pigs (36.72% increase), 863,419 poultry (11.02% decrease), 600 bison and 181 goats. Most of the cattle, sheep and pigs were from Ontario, Quebec, Manitoba and Alberta.

**V. DIVISION OF ANIMAL PATHOLOGY.**—The work of the division was concentrated on problems connected with food-producing animals. Some success was obtained with penicillin in treating cases of BOVINE MASTITIS. Sulpha compounds proved useless in the treatment of SWINE ERYSIPELAS. No satisfactory result was obtained in studies on the conditions which cause NECROTIC ENTERITIS of pigs. Diagnosis of PULLORUM DISEASE was complicated by strains of the causative organism with similar bacteriological effects on poultry but different from the standard strains in their antigenic composition. When the atypical strains were the cause of losses, the standard test was only about 40% efficient. Much evidence indicated that non-pregnant animals gained some immunity against BOVINE CONTAGIOUS ABORTION when vaccinated, but that pregnant animals did not. The immunity gained was not permanent and animals vaccinated reacted to the agglutination tests, which interfered with control measures. The benefit to be gained from vaccination was therefore slight. COCCIDIOSIS of poultry, which was a cause of great economic loss, was experimentally treated with some success with sulphonomides. No satisfactory vaccine had been developed against EQUINE INFECTIOUS ANAEMIA. Experiments showed that the most potent vaccine against SWINE FEVER was only 50% efficient. Slaughter of infected and in-contact pigs was still considered the most efficient means of controlling the disease. In studies of TRANSMISSIBLE LEUCOSIS of fowls, there was no evidence of egg transmission. It was thought that infection might take place through the respiratory mucous membrane: this was of interest, as laboratory-transmitted infection had so far been by blood inoculation. D.D.T. was found in extensive tests to be a safe insecticide for the destruction of external parasites of domestic animals. It was no use in treating round worm infestations of pigs or TRYPANOSOMIASIS. [No details are given of how it was used for these

diseases, or of the species of trypanosomes concerned.]

**ANIMAL HUSBANDRY DIVISION.**—Investigations on beef cattle production were mainly concerned with the maximum amount of grass in the diet and the minimum use of grain. Indirectly related to this was the improvement of pastures by the use of fertilizers and the provision of green succulent grazing throughout the summer. The health of dairy herds was good and they remained free from TUBERCULOSIS. A minor outbreak of BOVINE CONTAGIOUS ABORTION was cleared up by the elimination of reactors. Losses of calves in 1943-44, the cause of which was not definitely determined at the time, did not recur in 1944-45 and are now thought to have been due to vitamin deficiency. Artificial insemination with semen from the Holstein and Ayrshire bulls was limited to three cows of any one breeder. This was provided free of charge. Horse breeding declined further in 1944, only 29 mares being bred to the two Clydesdale stallions maintained by the Division. An experiment with mixed grazing of pastures with cattle and sheep showed that the daily gains of lambs on mixed grazed pastures was greater than on pasture grazed by lambs only and the carrying capacity of the former was 23.2% greater. The proportion recommended was three ewes and their lambs to one two-year-old steer. In the control of ANAEMIA of young pigs it was found that the provision of iron in the form of ferrous sulphate was a good preventative measure. A solution of ferrous sulphate poured on sods was found to be the most convenient means of giving the young pigs access to the iron salt.

**HEALTH OF ANIMALS DIVISION.**—The RABIES outbreak in Essex county, Ontario, was confined to that area. Outbreaks of SWINE FEVER occurred in the provinces of Nova Scotia, New Brunswick, Ontario and Manitoba. Compensation was paid for the infected and in-contact pigs which were slaughtered in all outbreaks. There was only one outbreak of HORSE MANGE in New Brunswick. There were no outbreaks of ANTHRAX, GLANDERS, DOURINE or SHEEP SCAB.

**MEAT AND CANNED FOODS SECTION.**—Ninety-five establishments were functioning. Animals slaughtered totalled 2,178,669 cattle (27.32% increase), 989,910 sheep (1.47% decrease), 7,878,179 pigs (6.16% decrease) and 1,810,700 poultry (51.80% increase).—J. A. GRIFFITHS.

CANADA. (1946.) **Report of the Ontario Veterinary College, 1945.** [MACNABB, A. L.] pp. 27. Toronto: T. E. Bowman. 8vo. 1906

Dr. C. D. MCGILVRAY, the Principal, retired after 27 years' service.

There were 237 students in attendance and of these 126 were ex-servicemen. There were only



eight women students enrolled and from June no more were being accepted. The degree granted to graduates in 1946 was D.V.M., University of Toronto. Former graduates of the Ontario Veterinary College can apply for the new degree. Entrance requirements have been raised and the curriculum has also been revised slightly, more time now being devoted to biochemistry and physiology. In the first year, pharmacy and "human geography" have been added. In the second year, a course in nutrition, and in the third year, one on diseases of pigs are given in addition to the general series on diseases of cattle, sheep and pigs and a separate class in haematology. The meat hygiene course for the fourth year now includes other edible products and has been renamed food hygiene. The first year work includes instruction in artificial insemination, public health bacteriology and diseases communicable between man and animals.

In the extension service, the MASTITIS laboratory received 4,123 milk samples between November, 1945, and March, 1946. 2,005 were negative, 23.76% contained *Str. agalactiae*, 2.4% *Str. uberis*, 3.9% *Staph. aureus*, 20.8% streptococci other than MASTITIS strains, and 0.6% *Corynebact. pyogenes*. Continued observations on the use of herd-autogenous bacterins were made and 40 bacterins were prepared. In tests of penicillin best results were obtained when an inhibitory level was maintained for three consecutive days, but *Str. agalactiae* was more resistant in acute outbreaks of MASTITIS than when present without the animal's showing clinical symptoms. A total of 99,152 blood samples was tested for BOVINE CONTAGIOUS ABORTION, 36.77% being positive. These included calf vaccinations, of which 86.32% were positive, experimental adult vaccination (66.79% positive), routine tests of individual herds (21.46% positive), Prescribed Area Plan tests (3.03% positive) and animals for export (3.53% positive). A total of 92,401 calves had been vaccinated with strain 19 *Br. abortus* vaccine prepared at the Veterinary College. Routine examinations of poultry sent or brought to the laboratory totalled 3,629. A list of disease conditions is given. Over 29.2% were cases of PULLORUM DISEASE, 14% COCCIDIOSIS, 6.44% due to helminths, 5.9% LYMPHOMATOSIS and 25.93% deficiency diseases: 216,625 doses of FOWL Pox vaccine and 57,600 doses of INFECTIOUS LARYNGO-TRACHEITIS vaccine were distributed. INFECTIOUS RHINITIS in pigs (BULL NOSE) assumed major proportions and continued to spread at an alarming rate [see PHILLIPS —V.B. 17. 18]. The cause was not known. The report includes photographs of the lesions.

The Teaching Departments were heavily burdened by the large number of new students

who took up the whole time of the staff in teaching. In the Department of Anatomy the time available for students to carry out the work was found inadequate to cover the subject or for students to assimilate and keep up with the course. A certain amount of research was carried out. In the Department of Hygiene the main work was teaching. Students of the third and fourth years were instructed in bacteriology. Routine examinations of 155 specimens were made. In the Department of Histology, teaching histology and embryology to first and second year students was the main task. A limited amount of investigation was made on hereditary abnormalities and congenital malformations in pigs. This was a long-range project. The Department of Medicine teaches materia medica, therapeutics, diseases of cattle, sheep and pigs, obstetrics and breeding hygiene, the prevention of disease, its treatment and control. There is much extension work in a consultant capacity with practising veterinarians. Additions to the staff have been made but the increase in numbers of students given elementary clinical classes has counter-balanced this. The Department provides the veterinary services for the livestock of the College. The clinic dealt with 152 cattle herds (745 head), 1,247 pigs, 1,375 sheep and 21 horses and carried out 161 pregnancy tests. The extension service provided cobalt to farms deficient in this element. "Protamone" [thyro-active iodocasein] was issued for barren and slow-working bulls and ascorbic acid solutions were used for shy breeding cows through veterinary practitioners.

The Department of Parasitology provides an advisory service for the fur-bearing industry. Courses in parasitology were given to third and fourth year students. There are also routine investigations in parasitology and some research work. 116 P.M. examinations were made on fur-bearing animals. PNEUMONIA, FOOD POISONING, DISTEMPER and NUTRITIONAL ANAEMIA were the chief causes of losses among mink. Of 16 foxes examined P.M., eight had NEPHRITIS. Extension work on fur farms and attending meetings of farmers was an important part of the duties carried out. Investigational work on the diseases of fur-bearing animals was recorded. 7,382 doses of formol tissue DISTEMPER vaccine for mink were prepared and 5,512 doses were issued to veterinarians for immunizing mink.

A course in fur-bearing animal husbandry and diseases was given to veterinary students. Diseases investigated by the Department of Pathology included SALMONELLOSIS, BOVINE MALIGNANT CATARRH, GRANULAR VAGINITIS and INFECTIOUS KERATITIS in cattle and TOXAEMIA of calves.

448 specimens were investigated by the Pathological Laboratory Service.—J. A. G.

U.S.A. (Undated.) **The Rockefeller Foundation. International Health Division. Annual report, 1945.** pp. 147. New York: Rockefeller Foundation. 8vo. 1907

The International Health Division has for its purpose the promotion and development of public health activities throughout the world. It has a staff of 80 trained scientists, most of whom combine executive tasks with field and laboratory investigations, and works in co-operation with, or on the invitation of governments or universities and special institutes. Attention is centred on about 12 diseases and of these INFLUENZA, YELLOW FEVER and MALARIA are now receiving major emphasis and occupy most of the space taken up by this report.

Experimental studies on RABIES showed that a high degree of immunity was obtained in dogs by the single injection method of vaccination [nature of vaccine not stated] and that this persisted for one year. Although this method did not produce 100% resistance, it would be difficult for the disease to be maintained if all dogs were inoculated. The three injection method of vaccination produced a higher degree of immunity than the single injection method. Vaccination of owned dogs had, however, to be supplemented by the destruction of ownerless dogs.

Many workers had shown that infection of a host by one virus could, under certain conditions, afford temporary protection against infection by another virus. This phenomena is known as "interference", and has been studied by the YELLOW FEVER Service in Brazil, using tissue cultures. The diverse nature of the viruses between which interference has been demonstrated indicates that a fundamental mechanism common to all viruses studied is responsible for the phenomenon. The nature of the mechanism is not associated with antibodies, but is clearly connected with some interaction of virus and susceptible cells of the tissue culture.

It was found that of the ENCEPHALITIS viruses, West Nile virus-immune serum neutralized the St. Louis virus, but not the Japanese virus; St. Louis-immune serum neutralized the West Nile and Japanese viruses, thus showing that these viruses were related. The relationship suggested by cross-immunity tests between Eastern, Western and Venezuelan EQUINE ENCEPHALOMYELITIS viruses were investigated by cross-neutralization tests on three-day-old mice inoculated subcutaneously. There was no evidence that these viruses possessed any antigenic components in common. Two viruses causing PNEUMONIA in cats were thought to be possibly associated with the disease in man.

The effect of sulphamerazine on pulmonary infections of mice, hamsters, rats and cotton rats and also on yolk sac infections of chick embryos with the viruses of murine and feline pneumonia showed that the drug was inhibitory for the mouse virus in these animals, but much less effective with the cat virus, even when doses near the toxic level were administered. Penicillin inhibited yolk sac infections in chick embryos infected with the viruses of MENINGO-PNEUMONITIS, LYMPHO-GRANULOMA VENEREUM, MURINE PNEUMONITIS and FELINE PNEUMONITIS. Atebrin and certain derivatives of 4-amino-quinoline had slight activity against viruses of the PSITTACOSIS-LYMPHO-GRANULOMA group.

Further research on animal nutrition showed that large quantities of maize meal in the diet of rats induced an increased need for niacin. It appears that animals fed on a diet low in protein require either greater amounts of known B vitamins or else some of the less well-known factors, as compared with animals on a high protein diet. Growth appears to be the first factor affected when there is a reduction in dietary protein. A study of the oral manifestations (angular stomatitis and glossitis) of iron deficiency was completed. Because of the similarities of the SPRUE syndrome in man to those of folic acid deficiency in monkeys, synthetic folic acid was tried and proved effective in three cases of non-tropical SPRUE. At Harvard University, rats made diabetic by injection with alloxan had no increased tendency to thiamine deficiency and their thiamine requirements were less than those of normal controls. Thus, the theory that thiamine deficiency as a cause of DIABETIC NEURITIS does not appear to be substantiated.

The duck, like the chick, requires for good growth more amino acids than those supplied by 18% casein. Biotin, folic acid and niacin particularly are required by the duck. Severe acute pyridoxine deficiency in young ducklings is characterized by growth failure and a severe microcytic anaemia. In older ducklings pyridoxine deficiency produces paralysis and convulsions. Additional choline to the diet of a choline-deficient puppy resulted in rapid improvement of liver function and decreased lipid content of the liver, normal function being restored in 5-10 days. Preparations of fat emulsions suitable for intravenous injection for the dog were made.—J. A. G.

U.S.A. NEW YORK. (1946.) **Report of the New York State Veterinary College at Cornell University for the year 1944-1945.** [HAGAN, W. A.] pp. 205. Geneva: W. F. Humphrey. 8vo. 1908

By continuous teaching, without any summer breaks, the college succeeded in graduating two extra classes during 1942-45: this seriously



affected the amount of research done during these years. Students were unable to devote any time to seeing practice and this adversely affected the efficiency of graduates. The course has now been revised to throw more emphasis on clinical instruction, students being required to take full charge of cases. A four weeks' refresher course for demobilized veterinarians has been added to the existing informal post-graduate course. There has been close collaboration with the Extension Service of the College of Agriculture in winter extension schools. About 25,000 farm animals were treated in the ambulatory and consulting clinics, the number of dairy cows exceeding all other species combined. More than 4,000 domestic pets were treated in the Small Animals' Clinic and 1,600 outbreaks of disease were investigated in the poultry clinic.

The college library now contains 17,000 books and 141 periodicals are currently received.

Feeding infected milk to calves which were allowed to suck each other did not produce MASTITIS, neither did it confer any immunity to the disease. The Hotis test, supplemented by stained films from incubated milk samples offered a simple and fairly accurate check on results of physical examination of udders, but use of blood agar plates was better when time and facilities permitted. Penicillin gave promising results as a cure for MASTITIS. A two-year survey of milch cows showed that the incidence of MASTITIS was correlated directly with milk production. Of the 719 cows in the survey, 163 became infected with *Str. agalactiae*, and 193 with staphylococci. Since neither tuberculin nor the serological test are specific for TUBERCULOSIS, it is considered that the practice of regarding all tuberculin reactors as affected will have to be abandoned; otherwise reactors will continue to be found after the disease has been eradicated. Of blood samples from 14,000 turkeys tested for PULLORUM DISEASE, 251 were positive, and 55 were "suspicious". Eight years' work on calfhood vaccination with *Br. abortus* strain 19 showed that the abortion rate in controls was 18.68%, as against 4.46% in vaccinated animals and that the height of the blood titre following vaccination was not a reliable criterion on which to predict immunity. Reactions which persisted after vaccination were due to infection with virulent field strains, rather than to persistence of strain 19. A significant break in immunity occurred in the fourth pregnancy in animals which had been vaccinated as calves. In naturally occurring BOVINE CONTAGIOUS ABORTION, a high opsonic index did not indicate immunity to abortion, and there was no obvious quantitative relation between the opsonic and agglutinin contents of the blood of a given cow.

It appeared that effective immunity was not based upon the presence of opsonins, as cows which had been exposed to severe natural infection for years without contracting the disease sometimes had a low opsonic titre. Streptomycin prevented, but did not cure, artificial infection of g. pigs with *Br. abortus*. Cheese made from milk naturally infected with *Br. abortus* contained no viable organisms after a ripening period of three months.

During the early years of the college, the diagnostic laboratories received only a few hundred specimens per year, now, however, approximately 200,000 specimens are examined yearly. During 1944-45, of 477 heads from dogs suspected of RABIES, 46, in which Negri bodies were not found, proved to be positive upon inoculation of Swiss mice. It is suggested that the use of rabies vaccine militates against the formation of Negri bodies. A disease of cattle, which may have been BOVINE MALIGNANT CATARRH was investigated without obtaining positive results. NEWCASTLE DISEASE was diagnosed in New York State for the first time, although it had been recognised in the U.S.A. two years previously. Ultra-violet irradiation did not prevent air-borne infection from adult birds artificially infected with the virus of INFECTIOUS BRONCHITIS of chicks to susceptible birds. An acute infective disease which caused a 5-10% mortality in ducklings was investigated, but no causative agent had been identified. Sulphaquinoxaline was ineffective when used to treat birds naturally and artificially infected with FOWL CORYZA.

Heavy losses in feeding lambs had hitherto been thought mainly due to HELMINTHIASIS, but a year's study of the industry indicated that this was not so. A metal oesophageal tube was shown to be a satisfactory method of dosing sheep with anthelmintics.

Extensive studies of the cause and prevention of AVIAN LEUKOSIS were being carried out. A chorionic gonadotropin, follutein (Squibb), derived from the urine of pregnant mares, gave excellent results in the treatment of 16 cases of CYSTIC OVARY in cows. Trade products which are claimed to "energize" spermatozoa have been used without success. Work designed to investigate the value of vitamin A therapy in cases of BOVINE KETOSIS gave negative results. Total pancreatectomy in two calves produced mild DIABETES. Fatal cases of UREA POISONING were diagnosed in dairy cattle after a ready mixed ration purporting to contain 3% of the protein in the form of urea had been fed. As a result of inefficient mixing, some bags of the feed contained 15-20% of the nitrogen in the form of urea.

—G. B. S. HEATH.



## BOOK REVIEWS

BODDIE, G. F. [B.Sc. (Edin.), M.R.C.V.S., F.R.S.E., Professor of Medicine, Royal (Dick) Veterinary College, Edinburgh]. (1946.) **Diagnostic methods in veterinary medicine.** pp. viii + 370. 51 figs., 3 appendixes. Edinburgh: Oliver & Boyd. 2nd Edit. 8vo. 15s. 1909

In this second edition, the chapters on the locomotor system and clinical bacteriology have been rewritten, and the chapter by H. H. HOLMAN on clinical haematology has been revised. The account of the genitalia and mammae has been extended, but the diagnosis of pregnancy is dealt with in brief outline, the reader being referred to standard works on the subject for details. J. N. RITCHIE has revised the chapter on allergic reactions, while J. G. CAMPBELL has written a new chapter, dealing with the diagnosis of poultry diseases. A third appendix has been added, dealing with incubation periods. The total number of illustrations has been increased from 31 to 51 and eight excellent coloured reproductions from photomicrographs illustrate the chapter on clinical bacteriology.

The conditions dealt with are chiefly those occurring in the British Isles, a fact which limits the usefulness of the book for readers in other countries. As the title indicates, the book deals mainly with methods of diagnosis and insufficient emphasis is laid on the differential diagnosis of specific conditions. The usefulness of the book would be greatly increased by the addition of a section dealing with the diagnosis of specific diseases, summarizing briefly in each case their distinguishing features, the confirmatory diagnostic aids, and the selection from the living or dead animal of appropriate material for laboratory examination if required. This would further increase the value of the book as a work of reference; at present, for example, references to distemper are on nine separate pages, each in different chapters, and there is no connected description of the features which make up the distemper syndrome. The account of the methods of examination of urine might with advantage be incorporated with the account of interpretation of urinary abnormalities.

The index is hardly adequate and should be extended in the next edition; the following words, for example, are not found in it: abortion, acetonaemia, Aujeszky's disease, grass sickness, teart, trichomoniasis.

The book is well produced and the style pleasing. The method of dealing with the subject—describing in successive chapters the examination of each organic system in the various species of domestic animals—is likely to make the book

of particular help to the veterinary student, especially when beginning clinical studies or seeing practice. With expansion, the book could become a standard reference book.—E. COTCHIN.

LEACH, W. J. [Assistant Professor of Biology, Temple University]. (1946.) **Functional anatomy of the mammal. A guide to the dissection of the cat and an introduction to the structural and function relationship between the cat and man.** pp. viii + 231. Numerous figs. New York & London: McGraw-Hill Book Company, Inc. 8vo. 12s. 6d. 1910

The title of this book is rather misleading, as it is really a dissection guide of the cat; however, as it is intended for students interested in general mammalian anatomy and who normally would not be in a position to make a detailed study of many species, opportunity has been taken to point out structural and functional relationships particularly between cat and man.

The first chapter deals with general considerations in a concise form and, although it appears unnecessary to give an account of the classification of mammals, which can be found in any textbook of zoology, the form of presentation will be appreciated by the beginner.

The remaining chapters treat of the dissection of the cat, with constant references, particularly by means of illustration, to comparable regions in man: as the work is functional rather than descriptive, many interesting modifications of structure are introduced. The form of question and answer used in these chapters is highly commendable.

A very useful but short appendix covers laboratory preparation and preservation of dissection materials.

Apart from its value to the student of general biology, it can be said that this is one of the most useful books presented to the veterinary profession for study of the anatomy of the cat.—C. W. O.

GOIJON, A. [Directeur du Laboratoire Municipal]. (Undated.) **Le lait propre source de santé. [Clean milk a source of health.]** pp. 76. Le Mans: Librairie générale de l'Ouest. 8vo. Fr. 25. 1911

In his introduction the author points out that after nearly six years of almost total destruction of the nation's wealth, agriculture, less damaged than industry, can do much to assist the country to improve in the course of future years. The book is a genuine attempt to explain in simple language for the milk producer and those concerned in the manufacture of milk products, the basic principles of "clean milk" production. It is divided into



five chapters and the motto running through all of them is that clean milk is a source of health.

The first chapter concerns the milking cow: how to choose her, how to look after her and how to feed her to the best advantage. It is surprising, however, that in the description of a good cow there is no mention of the breed, and that in the section on milking, only hand-milking is described, there being no mention at all of milking machines. Moreover, while discussing the cooling of milk, the author recommends that milk churns be placed in a current of pure, fresh water and makes no reference to milk coolers. The second chapter deals with the physical and chemical properties of milk, its digestibility and the formation of curd in cheese making; a list of certain foods which may bring about taints in milk are also given. In the third chapter the bacterial content of milk is described and reference is made to pasteurization, both by the high temperature rapid method and by the low temperature "holder" process. To obtain satisfactory results, the pre-pasteurization milk must itself be "clean". It is admitted that pasteurization alters the chemical and bacterial properties to some extent: nevertheless, it is welcomed for the consumer. The danger that TB. may be spread from the cow to the human being through the medium of milk, even if the cow has no disease in the udder substance, is accepted. The choice of materials for the manufacture of milking utensils, their methods of cleaning and the use of pure clean water in the dairy are dealt with in this chapter.

In the fourth chapter the author discusses the butterfat content of milk and, at considerable length, butter making. The last chapter deals with the law relating to milk, frauds which may be perpetuated and adulteration of milk and butter and how it may be detected.

The book is essentially for the small producer, endeavouring to give him sound advice. As such, it should prove of great benefit.—D. S. R.

ADRIANI, J. [M.D., Director, Department of Anaesthesia, Charity Hospital of Louisiana at New Orleans, Clinical Assistant Professor of Surgery, Louisiana State University School of Medicine]. (1946.) **The chemistry of anaesthesia.** pp. viii+530. 45 figs., 18 tables. Oxford: Blackwell Scientific Publications. 8vo. 35s. **1912**

This book is based on the course of instruction given to post-graduate students and anaesthetists

by the author during his work as a teacher in three American medical schools. The text is divided into three parts, the first dealing with inorganic chemistry, the second with organic chemistry and the third with biochemical and pharmacological problems. The subject is dealt with very fully and there is an extensive bibliography.—E. G. W.

BARCROFT, J. [Director of the Unit of Animal Physiology, Agricultural Research Council, Cambridge]. (1946.) **Researches on pre-natal life. Volume I.** pp. xiii+292. 124 figs., 87 tables. Oxford: Blackwell Scientific Publications. 4to. 37s. 6d. **1913**

In the preface Professor BARCROFT states that "this work partakes very much of the nature of a will" and this, alas, proved to be true. One is left wondering how, after his many scientific discoveries, he was still able to throw himself with characteristic enthusiasm into this new field of work and achieve so much.

The book is concerned with the development of function in the mammalian foetus and in 13 chapters discusses the function of the placenta in relation to the foetal development, the effect of diet on the growth of the foetus, the volume and distribution of blood in the foetal circulation and the transfer of blood from the placenta to the foetus at birth, the amount of oxygen used by the foetus and the rate at which it is transported, foetal blood pressure, pulse rate and vascular reflexes, the relation of the blood to oxygen and carbon dioxide, the circulation in the diet, and pre-natal and neo-natal respiration. Each chapter has a useful bibliography.

The personal touch of an acute brain is combined with humour and understanding and the result makes delightful reading. The book is beautifully produced and illustrated.—J. M. R.

HOSKINS, M. M. [Ph.D., Departments of Anatomy, The Graduate School of Arts and Science and College of Dentistry, New York University], & BEVELANDER, G. [Ph.D., Departments of Anatomy, The Graduate School of Arts and Science and College of Dentistry, New York University]. (1945.) **Essentials of histology.** pp. 240. 135 figs., 2 plates. St. Louis: C. V. Mosby Company. 8vo. \$3.50. **1914**

This is a textbook for students. There are admirable line drawings but no indication is given of magnification used; the colour plates are excellent. The text is lucid and the book as a whole is most satisfactory.—L. M. MARKSON.



## INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

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